



A
HANDBOOK
OF
PSYCHOLOGY

BY
J. CLARK MURRAY, LL.D., F.R.S.C.

JOHN FROTHINGHAM PROFESSOR
OF
MENTAL AND MORAL PHILOSOPHY, M'GILL COLLEGE, MONTREAL.

FIFTH EDITION

BOSTON
DE WOLFE, FISKE & CO.
361 AND 365 WASHINGTON STREET

BF131 M9

COPYRIGHT, 1897

DeWOLFE, FISKE & CO.

All rights reserved

PREFACE TO THE SECOND EDITION.

IN the preface to the first edition it was explained that "this handbook is designed primarily to introduce students to the science of psychology; and to this design every other purpose, which the book may serve, has been made subordinate. Psychology embraces a considerable body of systematised facts which are beyond dispute; but there are also some problems, still unsettled, which affect even the fundamental principles of the science. No fair exposition of the science is possible without indicating the expositor's standpoint in reference to these problems; but it is not advisable to perplex the beginner with a prefatory discussion of controverted questions; and to the more advanced student, who may honour the book with a perusal, its general standpoint ought to be evident without preliminary explanations."

The original object of the book has been always kept in view in the present edition. Numerous alterations have been suggested on revision; but these, though adding on the whole a few pages to the volume, are not individually of such importance as to require specific mention.

I may observe that, had I received Professor Ladd's *Elements of Physiological Psychology* in time, I should have referred to it at p. 12, as the best equivalent in English for the great German work of Wundt.

J. CLARK MURRAY.

Montreal, 16th April, 1883.



CONTENTS.

INTRODUCTION.

§ 1. Definition of Psychology,	.	.	.	.	Page
§ 2. Method of Psychology, -	.	.	.	.	1
					4

BOOK I.—GENERAL PSYCHOLOGY.

PART I.—ELEMENTS OF MIND,	.	.	.	.	17
CHAPTER I.—GENERAL NATURE OF SENSATION,	.	.	.	.	18
§ 1. The Sensible Organism,	.	.	.	.	18
§ 2. Agencies which Excite Sensibility,	.	.	.	.	21
§ 3. Classification of Sensations,	.	.	.	.	29
CHAPTER II.—THE SPECIAL SENSES,	.	.	.	.	33
§ 1. Taste, -	.	.	.	.	33
§ 2. Smell, -	.	.	.	.	37
§ 3. Touch, -	.	.	.	.	41
§ 4. Hearing, -	.	.	.	.	48
§ 5. Sight, -	.	.	.	.	56
CHAPTER III.—THE GENERAL SENSES,	.	.	.	.	62
§ 1. General Sensations connected with a Single Organ,	.	.	.	.	64
§ 2. General Sensations not limited to particular organs,	.	.	.	.	70

PART II.—THE MENTAL PROCESSES,	75
CHAPTER I.—ASSOCIATION,	76
§ 1. Primary Laws of Suggestion,	77
§ 2. Secondary Laws of Suggestion,	88
CHAPTER II.—COMPARISON,	109

BOOK II.—SPECIAL PSYCHOLOGY.

INTRODUCTION,	115
PART I.—COGNITIONS,	119
CHAPTER I.—PERCEPTION,	121
§ 1. Perceptions of Taste,	127
§ 2. Perceptions of Smell,	133
§ 3. Perceptions of Touch,	139
§ 4. Perceptions of Hearing,	152
§ 5. Perceptions of Sight,	163
§ 6. Muscular Perceptions,	188
CHAPTER II.—GENERALISATION,	191
§ 1. Abstraction,	191
§ 2. Generalisation Proper,	195
§ 3. Denomination,	202
CHAPTER III.—REASONING,	209
§ 1. Conception,	211
§ 2. Judgment,	213
§ 3. Reasoning Proper,	217

Contents.

ix.

CHAPTER IV.—IDEALISATION, . . .	226
§ 1. The Speculative Ideal, . . .	228
§ 2. The Æsthetic Ideal, . . .	229
§ 3. The Ethical Ideal, . . .	241
§ 4. The Religious Ideal, . . .	244
CHAPTER V.—ILLUSORY COGNITIONS, . . .	247
§ 1. Illusions in General, . . .	247
§ 2. Dreaming, . . .	256
§ 3. Hypnotic States, . . .	266
CHAPTER VI.—GENERAL NATURE OF KNOWLEDGE, . . .	282
§ 1. Self-consciousness, . . .	287
§ 2. Time, . . .	295
§ 3. Space, . . .	299
§ 4. Substance, . . .	304
§ 5. Cause, . . .	309
PART II.—FEELINGS, . . .	312
INTRODUCTION, . . .	312
§ 1. The nature of pleasure and pain, . . .	313
§ 2. The expression of the feelings, . . .	333
§ 3. Classification of the feelings, . . .	337
CHAPTER I.—FEELINGS OF SENSE, . . .	339
CHAPTER II.—FEELINGS ORIGINATING IN ASSOCIATION, . . .	359
§ 1. Feelings for external nature, . . .	361

§ 2. Feelings for self,	366
§ 3. Feelings for others,	370
CHAPTER III.—FEELINGS ORIGINATING IN COMPARISON,	389
CHAPTER IV.—INTELLECTUAL FEELINGS,	397
CHAPTER V.—FEELINGS OF ACTION,	402
PART III.—VOLITIONS,	405
CHAPTER I.—THE GENERAL NATURE OF VOLITION,	406
CHAPTER II.—THE MOTIVE POWER OF THE FEELINGS,	410
CHAPTER III.—EXTENSION OF VOLUNTARY CONTROL OVER MUSCLES, FEELINGS, AND THOUGHTS,	419
CHAPTER IV.—FREEDOM OF VOLITION,	426
CHAPTER V.—CONCLUSION,	431

I
of
an
to
ne
for
An
des
wor
spo
.
tivel
durin
least
disco
135-6
† C
by M

PSYCHOLOGY.

INTRODUCTION.

§ 1.—*Definition of Psychology.*

PSYCHOLOGY* is the name now generally applied to the science which investigates the phenomena of the mind. Mind † is also denoted by the words *soul* and *spirit*, while in modern times it has become common to use, as equivalent to these, certain expressions connected with the first personal pronoun, thrown into the form of substantives—the *I*, the *me*, the *ego*, the *self*. Another modern fashion in psychological language is to describe the mind by the term *subject*. The external world, when contrasted with mind or soul or spirit, is spoken of as *matter* or *body*; it is opposed to the terms

* This name, though derived from ancient Greek, is of comparatively modern origin. It was used for the first time apparently during the sixteenth century, perhaps among the Ramists; at least, Freigius is the earliest author, in whose writings it has been discovered. See Hamilton's *Lectures on Metaphysics*, Vol. i., pp. 135-6.

† On the history of the word *mind* a learned philological article by Mr. Earle will be found in *Mind* for July, 1881.

expressive of the first person as the *nunego* or *notself*, while the counterpart of subject is *object*. In recent times mental phenomena are frequently distinguished from *physical* by the term *psychical*,—a term of some advantage from its being cognate with the name of the science.

The phenomena of the self or mind are distinguished from those of matter by a very marked characteristic. Any material thing whether organic or inorganic, whether at rest or in motion or undergoing any internal change, is wholly unaware of its own condition. It is not so with *me*. I may be ignorant of innumerable actions and processes going on in my own body and in other bodies; but of what I *myself* do or suffer I must be cognisant, else it could not be said to be done or suffered by *me*. If I feel a pleasure or a pain, I must know that I feel it; and to deny my knowledge of the feeling would be to deny its existence. In like manner, when I see or hear, remember or imagine, believe or disbelieve, love or hate, I must know that I do so. Now, this knowledge of what is passing within me is called *consciousness*; and it forms the distinctive attribute of the mind or self.

To avoid misapprehensions, it may be observed that we often speak of doing an action *unconsciously*. This seems to contradict the assertion that consciousness characterises all the actions we perform. But the truth is, that, when we use this expression, we mean that such an action is in reality done, not by *ourselves*, but by those *notselves*,—those material things which we call our muscles, nerves, and brains. When a muscle twitches, or a nerve or brain-fibre thrills, without the movement being willed or intended by me, it is not I that produce the movement. It will be shown, in fact, that nervous and muscular actions often simulate strikingly the

appearance of being originated and controlled intelligently by me, when, in reality, they are immediately due to habits of body formed long before by myself, or perhaps by my ancestors, or by the general constitution of nature. But an action, of which we are wholly unconscious, is one with which we have truly nothing to do, and that is the reason why we often exculpate ourselves by pleading that we acted unconsciously, inasmuch as the action could not then really have proceeded from us.

It follows from this, that, in speaking of the mind, we must avoid supposing it to be the brain or the heart or any other portion of the material thing we call our body. We sometimes, indeed, by a figure of speech, use *brain* and *heart* to mean mind or soul; and the figure is allowable, so far as the inexact requirements of ordinary language are concerned. But, in scientific accuracy, "I" am not a brain, or heart, or system of nerves, or any part or the whole of a body.

It appears, then, that the distinctive characteristic of mind is, to be conscious of its phenomena; and, consequently, these phenomena are often described as phenomena of consciousness. Like the phenomena of external nature, those of our internal consciousness will commonly be found to be composite, and therefore to require analysis. In order to such an analysis, it is necessary to know the elementary materials which enter into the composition of the phenomena analysed; and accordingly the description of these materials will form the subject of the First Book of this work, which, as applying to all the phenomena of mind in general, may be appropriately styled General Psychology. The Second Book, to be distinguished as Special Psychology, will investigate the various combinations which form the special phases of our mental life.

Before proceeding to these subjects, some further introductory remarks may be found of service in reference to the method which should be adopted in the study of our science.

§ 2.—*Method of Psychology.*

The method of Psychology is determined by the nature of the phenomena which it investigates. The nature of these phenomena, as we have seen, is that they are always accompanied by consciousness on the part of their subject. It is consequently by means of this accompanying consciousness, directed by proper precautions, that we must investigate the mind. The proper precautions, indeed, must not be neglected in studying the phenomena of mind any more than in observing the phenomena of the material world; for it cannot be supposed that the ordinary consciousness of men will give them a scientific knowledge of what is passing in their minds more readily than their ordinary perceptions reveal the physical facts disclosed to the scientific observer. The precautions which the psychologist must adopt in order to direct and correct his observations, are not essentially different from those which must be taken by other scientific observers; they are rendered only more necessary inasmuch as nearly all the difficulties in the way of accurate observation are greatly enhanced by the peculiar character, especially by the extreme evanescence and complexity, of mental phenomena.

One of the most valuable safeguards against mistakes in observation is found by varying the circumstances in which phenomena are observed. Now this safeguard is

readily supplied to the psychological observer by refusing to satisfy himself with the mere introspection of his individual mind, and endeavouring to watch the mental operations of others, as far as these are expressed in their language and external conduct. The study of psychology, by reflection on one's own conscious life, is sometimes spoken of as the Introspective or Subjective Method, by observations on the minds of others, as the Objective Method. Though some schools reject or unduly depreciate the former, it is evident that both methods must be combined; for objective observations can be interpreted only by reference to the facts of our own consciousness.* In such observations it is important to seek the assistance of those studies which have for their object to inquire into the phenomena of human life that reflect the mental condition of men under every variety of external circumstances. The facts which reflect the mental life of man may do so either as being its product, or in so far as it is theirs. These it may be convenient to consider apart.

I. Of the phenomena which result from the action of the human mind, most have been already reduced to orderly study in separate sciences.

1. The main instrument which man employs for the expression of his conscious states is language, and there-

* Objective observations may sometimes usefully be extended to the mental life of the lower animals, which may occasionally throw light on the lower activities, at least, of the human mind; but the interpretation of the actions of animals, as implying facts similar to those of our consciousness, cannot be accompanied with too great caution. For the student who wishes to follow out this line of inquiry, probably the most serviceable aids are the two works by Dr. G. J. Romanes on *Animal Intelligence* and *Mental Evolution in Animals*.

fore the Science of Language will be found of continual service to the psychologist ; for whether in the wide researches of comparative philology, or in the etymology of isolated words, the speech of men often reveals the history of ideas and feelings and mental habitudes, which could not otherwise be traced with so sure a step.

2. The origin of language is hidden in the trackless distance of a prehistoric past ; so also is the origin of society and of the system of life which society entails. But the actual condition of society, both in our own day and throughout historical periods, is within our reach ; and there are few more fascinating branches of study than that which investigates the picturesque varieties of moral standard, of social custom, of political institutions, by which human life is diversified under different climates and at different stages of civilisation. The accumulation of evidence on these subjects, especially in recent times, throws occasionally a welcome light, if not on the origin, at least on the development of many feelings and ideas and convictions, which play an important part in the human consciousness. The collection and preservation of accurate statistics with regard to the existing phenomena and the current changes of society, are becoming a serious work among all civilized nations ; and the facts thus obtained may often be consulted for evidence of the operation of great mental laws.

3. The studies, which have just been indicated, belong to what older writers, with some propriety, were wont to describe as the Natural History of Man. But the civil or political history of man,—what we understand by history simply, including, of course, biography, which is but the history of individuals—is not without its value to the psychologist, as revealing the mental influences by which human life receives its determinate character in any

particular country at any particular time, as well as its development from age to age. In fact, the Philosophy of History must seek to bring the periods in the evolution of a nation, or in the vaster evolution of the human race, into harmony with the universal laws of the human mind.

4. But the phenomena, which most directly reflect the mental life of man, are the product of his mind in science and art. Science is evidently the systematic effort of human intelligence to unfold the intelligible order that exists throughout every realm of the universe; and the evolution of scientific ideas must be an exponent of the laws which govern the evolution of man's general intelligence. In science the cool intellect alone is called into play; in art the intellectual life is warmed with feeling. The fine arts, therefore, represent a double aspect of man's mental nature,—his power of knowing and his power of feeling. Accordingly the critical study of the fine arts,—of sculpture and painting, of music and literature,—will be found extremely serviceable in assisting to unravel some of the most complicated operations of the mind.

II. But the mind is not only a producer, it is also a product. It is true that the function of the mind is, by becoming conscious of the forces of nature, to free man from subjection to their unqualified sway. Still whatever freedom from the mere force of nature the mind may reach, there is another aspect in which it remains a natural product; and in this aspect it receives an explanation in the agency of those natural forces by which it is modified.

1. Here the vast cosmic forces of the solar system may be practically left out of account, as their influence on the human mind is of an extremely remote and indirect character. The changes of summer and winter, of day and night, of morning and evening, as well as the

varying phases of the moon, do exercise an appreciable influence over the thoughts and feelings of men. But the influence of these agencies in human life is not the irresistible domination of a natural force, such as they exert over vegetation, or over the life of migratory or hibernating animals; it is an influence which, in normal health, is completely under the control of intelligent volition, and grows tyrannical only when by disease life becomes helplessly subject to external nature.* It is true that the grandeur and mystery of the great cosmic movements have, in earlier times, exercised such a fascination over the human mind as to gain the credit of a direct influence on human life, the systematic interpretation of which formed the exploded science of astrology. But the general advance of human thought to the modern scientific point of view, is strikingly indicated when we contrast an antique astrological calculation on the effect of a man's "star" with the causal connection which recent observations have endeavoured to establish between the sun's spots and the social disasters which follow a famine.

2. Only less remote than the influences just described are those which have their origin in terrestrial nature,—the influences of a geographical, climatic, and meteorological character. Climate and geographical features have an undoubted power to mould the thoughts and feelings of men; but their effects in the history of the human mind have often been exaggerated by forgetting or underestimating the energy of intelligence in asserting

* The belief at least in the tyranny of the moon over the diseased mind is preserved in the Latin *lunaticus*, the Greek *σεληνιακός*, our English *moonstruck*, as well as the older expressions, *moonish* and *moonling*.

itself over the force of its environment. Soil and climate and weather determine absolutely the life of animal and plant; but man succumbs to their influence only in proportion as disease reduces him to the condition of a mere animal organism, and thereby renders impossible the independent play of intelligence.

3. But in what is appropriately called human *nature* we come upon a region of the natural forces, which necessarily have a very direct influence in modifying the mental life of man. Among the powers of human nature some may be distinguished as *universal* from others which are *particular*.

i. By the former are meant of course those powers which are common to the whole of mankind. Now, some of these are extrinsic to the individual.

(a) The modifying influences here characterised as extrinsic to the individual are the race to which he belongs, and those general tendencies of his time which are sometimes spoken of as the *Zeitgeist* or *spirit of the age*. Amid the innumerable varieties by which human beings are distinguished, there are certain prevailing types, along which these varieties are ranged; and such predominant types of variation may be traced in the mental as well as in the bodily characteristics. A type of this kind may often be referred to the common origin of the individuals in whom it predominates, and it then constitutes what we understand by a difference of race. It would be out of place, at this introductory stage, to discuss the explanation of race differences which may seem to be demanded by the present state of the science of man. It is sufficient to recognise the fact of the power which such differences are calculated to exert in shaping the character of a man's mind. But the influence of race is apt to be traversed by the influence of those mental tendencies

that are characteristic of the period in which a man's life is passed. And it must not be forgotten that both influences are qualified by the principle already noticed, that the mind, being essentially intelligent of the forces of nature, may rise above their unconditional sway, and direct their operation.

(b) But this qualification is of less value when we come to those influences of human nature which are intrinsic to the individual. These are two : one being of a permanent character—sex ; another, of a mutable character—age. Even these agencies, however, are not absolutely irresistible in their effects. The freedom of the mind from the tyrannous sway of sex is seen in the manly courage which emergencies have sometimes called forth in women, and in the womanly tenderness often displayed by stern men. Such freedom may occasionally reach an extreme of excess ; a person may become “unsexed,” though this cannot happen without a violation of human nature. Effeminacy in man, or masculine boldness in woman, are both unnatural monstrosities. In like manner the natural tendencies of age are also sometimes counteracted ; youth occasionally displays a sober thoughtfulness more characteristic of advanced life, while a happy juvenility of spirit is not infrequently carried down into a hale old age.

ii. But, besides the universal influences of race and sex and age, the human mind is subject to other influences that are particular, as they form the distinctive peculiarities of individuals.

(a) Sometimes these peculiarities are acquired in the course of the individual's life, and then they constitute his *habits* or character. Habit has been well named a second nature, for it acts in the same way as any tendency in the original nature of man. As habit is

acquired, so it can also be overcome, or supplanted by an opposite tendency. In fact, all hope of intellectual and moral improvement rests on the power of reforming habits.

(b) But there is a less variable sphere of human nature—that of the tendencies which are born in the individual. These form what we express by the French *naturel* in the largest sense of the term, comprehending all that is commonly understood by *genius* in the intellectual sphere, and in the emotional by *temperament* or *disposition*.

The contact of man with the general system of forces in his own, as well as in external nature, depends on the fact that, in one aspect, he is an animal organism. The part of this organism, by which his conscious relations with nature are governed, is the system of nerves distributed throughout his body and centred in his brain. Accordingly, among the auxiliary studies, to which the psychologist resorts, the highest value must be attached to human anatomy and physiology, in so far as these explain the structure and functions of the different parts of the nervous system. It must not, indeed, be supposed, as has been too hastily assumed by some, that the physiology of the nervous system can enable us to dispense with that direct observation of consciousness, which is the special province of psychology. For even if the system of nerves in the human body were known much more perfectly than at present, no observation of it could ever reveal anything but material structures and processes; no such observation could ever reveal the thoughts and feelings and volitions which make up our conscious life, or the laws by which these are governed. Still, it would be very unfortunate for the psychologist, were he unduly to depreciate the assistance which he may receive from the

physiologist. It may now be accepted as a fact, that with every phenomenon of consciousness a corresponding phenomenon is set up in the nervous system ; and it will often be found that a knowledge of the nervous action is the most trustworthy guide to a psychological explanation of the phenomenon in consciousness, or the most efficient safeguard against mistakes about its nature. The student of psychology will, therefore, be materially assisted by seeking at least such acquaintance with physiology as may be obtained from Professor Huxley's *Lessons in Elementary Physiology*, or from works which treat especially of the physiology of the nervous system in its bearing on psychology, like Dr. Carpenter's *Principles of Mental Physiology* or the more elaborate *Grundzüge der Physiologischen Psychologie* of Wundt. For the treatment of psychological questions in their connection with the evolutionism of the present day, the student should consult Spencer's *Principles of Psychology*, which will be found of great value in other aspects as well.

Most of the other studies, which have been referred to in this section as tributary to psychology, are comprehended under anthropology in the widest conception of its range. The student, who is not familiar with the researches of this science, will find an interesting account of their drift, and an admirable preparation for more detailed study, in the *Introduction to Anthropology*, by Dr. E. B. Tylor.

that
bond-
nd it
vious
gical
r the
ture.
rially
with
ley's
hich
stem
ter's
orate
ndt.
their
the
logy,
s as

d to
pre-
n of
the
unt
ore
by

BOOK I.



GENERAL PSYCHOLOGY.

AN analysis of the phenomena of consciousness discovers the fact, that they are composed of certain simple factors, which may be regarded as the elements of our mental life, and that the combination of these elements is due to certain simple processes. Accordingly this Book divides itself naturally into two Parts, devoted respectively to the elements and the processes of mental life.



PART I.

THE ELEMENTS OF MIND.

ELEMENTS are phenomena which are incapable of being decomposed; and therefore the elements of mental life are those simple facts, beyond which science, in its last analysis of consciousness, has been unable to go. Such elementary facts form merely what may be called the raw materials of mind; they are wrought into actual mental states only as they are combined by the processes which will be afterwards explained. These raw materials of mind are connected by natural law with the great system of natural phenomena; and the drift of the present investigation must be to trace that connection. In doing so we shall describe first the general nature of the mental elements, and then their specific forms.

CHAPTER I.

THE GENERAL NATURE OF SENSATION.

THE natural elements, of which conscious life is formed, are the phenomena called *sensations*.* A sensation is any consciousness arising from an action in the bodily organism. The organism, considered as endowed with the capacity of exciting consciousness, is said to be *sensitive* or *sensible*. The general capacity is spoken of as *sensibility*, and the particular forms of the sensibility are called *senses*. As sensation depends on the action of the bodily organism, it may be well, before examining the nature of sensation itself, to consider the structure of the organism, and the agencies by which its sensibility is excited.

§ 1.—*The Sensible Organism.*

All bodies act and react on each other. Even the mineral is subject, not only to the mechanical impulse of bodies impinging on it, but occasionally also to chemical

* On the various meanings of the term *sensation* see Hamilton's edition of Reid's Works, p. 877, note. A history of theories in regard to sensation will be found in the same work, Note D, § 1.

alteration from bodies in affinity with it, and to thermal and electrical changes as well. The vegetable, and even the most rudimentary form of animal, exhibit the influence of foreign bodies by taking from them the constituents necessary for existence or growth, and restoring them after a period to the environment. But the higher animal organisms, and that of man especially, possess the power of responding in an innumerable variety of ways to surrounding agencies, and this responsive power is due mainly to the elaborate differentiation of the bodily organs in general, and more particularly of the nervous system.

It is sometimes said that the brain is the organ of mind. It would be more correct to say that the mind finds an organ, that is, an instrument, in the entire animal organism; and this seems to be the explanation of the ancient doctrine, which, instead of restricting the soul to one part of the body, finds it "all in the whole, and all in every part." For the whole organism is, in every part, adapted to furnish materials for the building up of man's mental structure; but it owes this adaptation to the elaborate system of nerves, with which every part is more or less completely supplied. The nervous system of man is two-fold: it consists of two systems, which are distinguished as the cerebro-spinal and the sympathetic. The latter, by its distribution among the viscera, seems to be connected with the functions of organic life, rather than with those of the mind, though some hold it to be the special organ of the emotional nature.

The cerebro-spinal system, which certainly shows a vastly more intimate and complicated connection with mind, is divisible into two parts,—a central and a peripheral. The central portion is found in the brain and spinal cord. It is distinguishable to the eye by its

greyish colour, and appears under the microscope to be formed by masses of minute vesicles or cells. The other portion, which connects the centres with the extremities, as well as the different centres with each other, is white in colour. It consists of strands of fibres, distributing themselves in ever minuter ramifications to every part of the organism. Among these fibres two groups may be distinguished as possessing distinct functions. One group, which issue from each side of the front of the spine, carry impulses from the centre outwards, and thereby stimulate muscular movement; the other group, which issue from the back of the spine, transmit impulses inwards, and excite sensation. The nerves of sensation are, therefore, called *afferent* or *centripetal*; those of motion, *efferent* or *centrifugal*. The body is thus seen to be the organ of the soul, not merely as the passive recipient of sensations excited by the action of external bodies, but as a source of energy by which it reacts on these and produces modifications in them.

The afferent nerves, which are thus distributed over the body, are perpetually carrying to the spinal cord and brain the impressions which have been excited in the various organs; and these organs become thus the channels of different sensations. It is a moot point among physiologists, whether the specific differences of sensation are due to different nerves being endowed with different specific properties, or whether all nerves are identical in property, and become differentiated to different functions merely in consequence of the different uses to which they are put. This question, however, is of no essential moment to the psychologist; for him it is sufficient, that specifically different sensations are awakened by the various alterations to which the different organs of the body are subject. But of course it is

implied that a bodily organ can form the channel of sensation, only in so far as it is supplied with sentient nerve-fibres, and these are in uninterrupted connection with the brain. All the organs of the body are thus more or less sensitive; but in respect of their sensibility a marked distinction may be drawn between two classes. For one set of organs are evidently by their very structure adapted mainly to the special function of producing sensation, and these are accordingly said to be the organs of the *special senses*; while the other organs of the body give rise to sensation only incidentally, in performing the various functions of animal life, to which they are respectively adapted. But this is a distinction which can be conveniently explained only under the third section of this chapter, in the description of the various sensations we receive through the different organs.

§ 2.—*Agencies which excite Sensibility.*

The bodily organism, especially in consequence of its developed nervous system, is, as we have seen, responsive to the action of the various forces of nature; and these forces may accordingly be spoken of in general as the agencies which excite sensation. Now, the action of these forces is conceived as some form of motion, whether it be the motion of masses of matter, or motion among the particles of which masses are composed. Consequently, the immediate stimulus of sensation may, in every case, be represented as some kind of movement. The movement may originate in the organism itself; for all the higher organisms are preserved and developed only by innumerable processes, which are apt to produce alterations of nervous tissue that may excite sensibility. In other cases, and these are more numerous, the move-

ment originates in extraorganic bodies ; but it must always be translated into a nervous process before it can produce sensation.

Sensations are of innumerable various kinds ; they vary in accordance with the variation of the natural movements by which they are produced, and the part of the organism affected. There is, however, one difference among sensations, which traverses all others, and may therefore be noticed first. This is the intensity, that is, the degree in which a sensation absorbs consciousness. This property has a natural correspondence with the breadth or amplitude of the movement by which the sensation is produced, and by the *breadth* or *amplitude* of a movement is meant the space through which the moving body travels from the point of rest or equilibrium. It is true, as will be shown more fully in the sequel, the degree, in which a sensation absorbs consciousness, depends also on the voluntary strain of attention, however that is to be explained ; but still the *natural* tendency of any movement, which comes into contact with our organism, is to obtrude itself into consciousness with increasing force in proportion to every increase in its breadth. Now, as every movement may vary in breadth, every kind of sensation is liable to varying degrees of intensity.

Besides the general difference of intensity, sensations are distinguished by specific difference—differences of quality or kind. These may be conceived as due to the *form* of movement, and the form of a movement is itself due mainly to its *length* or *velocity*. There are, first, the long slow movements of material masses, which manifest themselves in the form of mechanical pressure, either by sensations of touch, or by sensations of resistance to muscular effort, or by felt pulsations upon the

skin, or throughout the nervous tissue. When movements become shorter and more rapid, reaching a velocity of between twenty and thirty in a second, they begin to affect an organ—the ear—specially differentiated to receive the impact of such vibrations, and then excite in consciousness the sensations of sound. The most rapid vibrations audible do not exceed 38,000 in a second, and even these are far beyond the limit of agreeableness. We must, therefore, pass over a vast interval before we reach the movements which manifest themselves in consciousness as sensations of heat. These movements lie at the lowest verge of luminous vibrations, the slowest of which, represented by the red rays of the spectrum, rise to the number of 451 billions in a second. But beyond the highest verge of light,—the violet rays, whose vibrations amount to 785 billions in a second,—there lie the atomic movements, which appear in the chemical or actinic action of light. Somewhere in this series lie the movements of electricity, the action of which on the nervous system produces the well-known electrical sensations of a sudden shock or a continuous thrill.

The phenomena of sensation are thus brought into relation with the general forces of the physical world; and the question will naturally occur, whether the relation is that uniform ratio, by which the physical forces themselves are held in a system of unalterable correspondences,—a system which is being gradually unfolded in the admirable investigations of modern science on the correlation and convertibility of the physical forces. If the correspondence of sensation to the physical forces is of the same kind, then both must admit of quantitative commensuration. That would imply that we are able (1) to measure the quantity of a given sensation, and (2) to form an equation between that quantity and a given

quantity of the physical force by which it is stimulated. The fact that the same sensation admits of more or less intensity, seems to furnish an obvious basis for quantitative measurements; and on this basis a new line of investigation has been opened up in recent times under the name of *Psychophysics*. It is contended that a psychophysical law has been established, expressing a measurable correspondence between the intensity of sensations and the quantity of physical force which forms their sensible stimulus.

To explain, it must be observed that the law is admitted to hold only within certain limits. The sensibility has a double limit,—one on the side of increase, another on the side of decrease.

I. On the latter it is evident there must be a point, below which a stimulus would be insufficient to excite the sensibility at all.

II. But on the other side also it is found that a given increase of stimulus is not always followed by a corresponding increase of intensity in the sensation produced. The effects of excessive increase are different.

1. Very often an extremely powerful or extremely prolonged stimulus may deaden the sensibility altogether. The ear is deafened by a very loud noise, the eye is blinded by excess of light. The skin also becomes insensible to a continued contact, like that of the clothing.

2. But in other cases the sensibility, instead of being deadened, is altered by an additional force of stimulus. The specific sensation, usually produced by an external agent, may disappear when the agent becomes unusually powerful, and be replaced by a general sensation of an unpleasant character. Thus, the sense of temperature gives way to an indefinite feeling of pain under excessive heat or excessive cold. At times, however, a specific

sensation of a new character is excited, that is to say, under certain conditions an increase of physical force produces, not an increased quantity, but a different quality, of sensation,—not the old sensation with a new intensity, but a new sensation altogether. Thus, the sensation of cold is not merely a lower degree of heat, though the stimuli of the two may be said to vary merely in force. So a diminution of light will make a white gray, and a blue black.

The sphere of the psychophysical law, then, is restricted by those limits within which the specific sensibility is not destroyed or altered. But within these limits the law claims to express the exact difference of sensation. The difference is not indeed the same for all sensations. It is said to be in the proportion 3:4 for hearing and touch, 15:16 for touch assisted by the muscular sense, and 100:101 for sight. But it is held that there is a constant difference for all the senses, and that this is expressed in the following law:—*To make sensations differ in intensity in the ratio of an arithmetical series, their stimuli must differ in the ratio of a geometrical series.*

Now, before discussing whether this law is verified by experience, it is worth while inquiring whether the relation between physical and psychical phenomena is such as to allow the establishment of any psychophysical law whatever. To determine this, it is necessary to consider the nature of the transition from physical stimulus to sensation. In this transition there are two stages which it is important to distinguish. 1. The physical movement must be translated into a nervous action; and though this may be conceived as a mode of motion, yet in the present state of physiology the precise nature of the motion is unknown, certainly cannot be differentiated in correspon-

dence with the differences of physical stimulus on the one hand or of sensation on the other. 2. The physical and nervous movements must be translated into sensation, into consciousness. Here is the point where the difficulties of psychophysics become insurmountable.

I. By the acknowledgement of all thinkers the transition from movement to consciousness is over a chasm which cannot be bridged by the ordinary ideas of science; and therefore there can be no strictly *scientific* explanation of the transition. The scientific incomprehensibility here is twofold.

1. There is a *general* incomprehensibility in the transition from movement to consciousness. This is not like the translation of one mode of motion into another. The one fact which renders possible the commensuration of the various physical forces, is the circumstance that they are all capable of being described in terms of motion. Even phenomena, like light or chemical action, which cannot by direct observation be proved to be modes of motion, may yet be hypothetically interpreted as such; and in fact they receive thereby such a fruitful scientific elucidation, as seems to afford an establishment of the hypothesis. But no similar hypothesis is conceivable in reference to the sensations of our conscious life; and consequently there is here an absolute break in the continuity of scientific interpretation, by which alone sensations could be brought into commensurable relation with the physical forces of the universe.

2. There is also a *special* incomprehensibility in the transition from any particular kind of motion to any particular kind of sensation. We cannot explain why air-waves appear in consciousness as sound, ether-waves as light, chemical movements as taste or smell. We cannot even discover any reason for the ratio between

changes in the velocity of movement and concurrent changes in sensation. There is indeed a certain uniform progress in tones correspondent with the varying velocity of the atmospheric vibrations on which they depend. Still the difference between a higher and a lower note cannot be intelligibly represented as having any similarity to the difference between a larger and a smaller number. In like manner an increase in the rapidity of ethereal vibrations exhibits no resemblance to the progress from the red to the violet side of the rainbow.

II. Another obstacle to the establishment of a psychophysical law is met with in the impossibility of finding one of the terms in the equation which the law supposes. As sensation requires both a physical stimulus and a sensitive organism, its intensity depends not only on objective, but also on subjective, conditions.

1. Now this implies, in the first place, that the intensity of the nervous action excited by the physical movement depends, not only on the force of that movement, but also on the state of the organic sensibility at the time. If the general organism is exhausted, as by an ordinary day's work, or by any extraordinary exertion, or if the particular organ affected is occupied by some other stimulus at the moment, the resulting sensation may be greatly enfeebled, while it is susceptible of violent intensity, not so much from the normal vigour of the organism, as from abnormal irritations due either to emotional excitement or to inflammatory disease.

2. But leaving these organic conditions of intensity out of account, there are mental conditions which oppose an insuperable barrier in the way of any such quantitative measurements as that under consideration. These mental conditions are summed up in the fact that we are intelligent beings. The primary datum for forming an

equation between our sensations and their physical stimuli is, as we have seen, a determinate intensity of sensation. But we have no means of discovering what is the real intensity of any man's sensations; we can obtain merely the judgment which he has formed of their intensity. Now there is no reason to suppose that men's judgments are not in this matter, as they are well known to be in others, deflected from the truth by many a bias.*

Another quantitative calculation has endeavoured to find the interval of time that elapses between the occurrence of a physical stimulus and a resulting sensation. Here, again, it must be born in mind that organic conditions are called into play. The physical stimulus must be converted into a movement in nervous tissue, and transmitted along nerve-fibre. The rate at which nerve-force is propagated along nerve-fibre must evidently be modified by causes similar to those which interfere with intensity. It would appear, therefore, that any rate of velocity, which may be assigned to nerve-force, can be at best but an average gathered from a numberless variety of rates. But this question belongs to the physiology of the nervous system, rather than to psychology. If we waive the physiological question altogether, there is still a psychological factor in the general problem. For the velocity, with which a physical phenomenon is

* The origination of psychophysical investigations is due to a veteran German physiologist, G. T. Fechner, though he generously ascribes to Professor E. H. Weber the discovery of the psychophysical law. His original work, *Elemente der Psychophysik* (1860), is now out of print; but a resumé of its doctrines, as well as of the controversies and the literature which it has called forth, will be found in a later small work by the same author, *In Sachen der Psychophysik* (1877). More recently he has again returned to the subject in *Revision der Hauptpunkte der Psychophysik* (1882).

followed by a recognition of it on the part of an intelligent being, depends on the judgment which is involved in the act of recognition ; and that leads us into a sphere beyond the range of mere physical causation. It is a well known fact, therefore, that, whenever accurate observations are required in reference to time, remarkable variations of judgment appear among different observers. These variations have attracted attention especially in the science of astronomy, where accuracy of calculation depends on exactness, even to fractions of a second, with regard to the time of an astronomical event ; and consequently it has become necessary, in taking observations, to form a "personal equation" in order to eliminate possible error from this source.

§ 3.—*Classification of Sensations.*

We have seen that sensations differ not only in intensity, but also in quality or kind ; and we have now to seek a systematic arrangement of the different kinds of sensation in the same fashion as other sciences classify the phenomena with which they deal. For such an arrangement the first requisite is a natural principle of classification. Now the sensations, by their very nature, seem to furnish such a principle ; for they are connected, by some kind of natural law, with the alterations in nervous tissue that are brought about by the forces of the external universe. But these forces generally produce a different effect on different parts of the nervous organism ; and therefore the differences of sensation hold a certain correspondence with the difference of the organs in which they originate. The distinction, then, between the organs of sensibility forms the fundamental principle

on which the sensations are classified. At the same time there are other facts, to which a subordinate value must be attached in guiding our classification. For even if we include in one genus all the sensations which originate in one organ, yet among these, numerous species, and still more numerous varieties, may often be distinguished. To trace such distinctions we must at times simply appeal to observations of consciousness, which are familiar to the every-day experience of men. For sensations, being the simple or elementary facts of mind, cannot be defined or described by anything more simple or elementary. The only way in which a sensation can be made known is by being *felt*. No descriptive language can ever make a person know what any particular sensation is, if he is incapable of feeling it. Those who are born blind can form no conception of a colour, nor those born deaf of a sound; and if any one wishes to know the taste, or odour, or touch of a substance with which he is not familiar, he must taste or smell or handle it. But men who are normally formed feel all the ordinary sensations of human life, and denote them by familiar terms; so that we have no difficulty in referring to them as well-known facts of consciousness. For the differences of sensation are often clearly marked in our ordinary conscious life; and we can generally direct or correct our observations of these differences by referring to the organic processes or the physical agencies in which they have their origin. In fact, these agencies and processes are sometimes adopted as guides to independent classifications of the senses which, even though imperfect, are full of fruitful suggestions. Thus, in reference to the organic process by which sensation is excited, the senses have sometimes been separated into two classes, distinguished as mechanical and chemical, touch being taken as type

of the former, taste and smell of the latter. Again, the senses of smell, taste, and touch may be characterised as being adapted to the gaseous, the liquid, and the solid conditions of matter respectively; while hearing and sight, thermal and electrical sensibility, respond to the vibratory movements of which molecules or atoms are susceptible.

But the accepted classification of the senses is that which follows the classification of the sentient organs. It is too common, however, to accept a popular description which represents by far too restricted a conception about the varieties of sensibility. We have seen that we gain an adequate view of the complicated instrumentality with which mind is endowed, only when we regard the whole body, and not the brain merely, as the organ of mind. The whole bodily organism, with its elaborate system of nerves, is perpetually vibrating to the innumerable vibrations of the world's forces, and wakening into consciousness the innumerable sensations that form the materials of our mental life. The kinds of sensation, therefore, are as various as the organs of the body, and the processes to which these are subject. Now, the classification of the bodily organs and their processes will naturally follow the order which is generally found convenient for anatomical and physiological description. But there is one group of organs distinctly marked off from the rest by the fact, that, by their very structure, they are adapted primarily to the function of giving specific kinds of sensation, and any other function they may subserve in the animal economy is evidently subordinate. Such, for example, are the ear and the eye, whose peculiar formation obviously renders them susceptible of being affected by the sound-waves of the atmosphere, and the light-waves

of ether respectively: these are the functions, to which they are specially differentiated. Accordingly, such organs are distinguished as the organs of the *special senses*. The other organs of the body do give rise to sensations; but they do so only incidentally, in the performance of the various functions to which they are specially adapted by their structure. The muscles, the stomach, the lungs, and the other organs of animal life, are thus, at the same time, organs of sensation. The susceptibility of sensation, which is thus spread over the organs of the body in general, is commonly called the *general sensibility*. Its various forms may, in contrast with the special senses, be appropriately named the *general senses*; but the language of psychology, in reference to this distinction, is not yet fixed.

CHAPTER II.

THE SPECIAL SENSES.

THESE are what are called *the five senses*. They are here, for a reason that will be afterwards explained, taken up in the following order:—taste, smell, touch, hearing, sight. In the account of each we shall follow the order already adopted in treating of sensation in general; we shall describe (1) the organ, (2) the substances or agencies by which the organ is excited, (3) the sensations which result from such excitation.

§ 1.—Taste.

(A) The *organ* of this sense is situated in the back of the mouth. The most important parts of the organ are the posterior region of the upper surface of the tongue, and the soft palate, that is, the posterior portion of the palate. But the adjoining structures, called the pillars of the soft palate and the tonsils, are also sensitive to taste. The gustative sensibility of the palate has impressed itself on ordinary language in the use of the word *palate* for taste, not only as a noun, but, formerly, also as a verb,* and in the verbal adjective *palatable*.

* "Not palating the taste of her dishonour."

Troilus and Cressida, Act iv., Sec. 1.

(B) *Sapid substances*, as belonging to the physical world, form a subject of investigation for the physical sciences. It is for the chemist especially to trace the constituent of any substance, on which its taste depends. It may be sufficient here to notice merely two facts about *sapid bodies*,—one referring to their physical condition, the other to their chemical character. The first is, that they must all be either liquids or solids in a state of solution; it is, in fact, a familiar experience of every-day life, that a dry substance yields no taste till it has been moistened or dissolved in the mouth. The other fact with regard to *sapid bodies* is that they are *crystalloids*, while *colloids* are tasteless.

It is for the physiologist to explain the mode in which *bodies* act upon the organ of taste. It has been already mentioned that taste ranks among the senses which are distinguished as chemical; and it does so because *sapid substances*, when dissolved in the mouth, seem to undergo some kind of chemical reaction, by which they stimulate the terminal filaments of the gustatory nerve. A dry substance could not set up the necessary reaction, and a colloid, being unable to permeate animal tissue, could not reach the nerves underlying the mucous membrane of the mouth. Only *crystalloids*, therefore, in a state of solution can excite taste.

(C) Among *gustatory sensations* or *tastes* we must distinguish those that are properly, from those that are improperly, so named.

I. Of *tastes proper* there have been various attempts at classification. "Plato and Galen reckon seven, Aristotle and Theophrastus eight, species of simple tastes. These are estimated at ten by Boerhaave and Linnaeus, by Haller at twelve."* More modern writers have given

* Sir W. Hamilton in *Reid's Works*, p. 116, note.

different enumerations, so that no classification can yet be said to be universally accepted.

II. But many sensations are *improperly* called tastes, being in reality sensations of a different sense altogether, or mixed with such sensations.

1. Smell undoubtedly contributes to many so-called tastes. This fact seems to be implied in the words *flavour* and *savour*, which are both used for tastes and smells indiscriminately; and it was pointed out so long ago, at least, as by Lord Bacon.* It explains why a catarrh generally renders a person insensible apparently to tastes which can be readily appreciated in health, the real insensibility being to the odour of bodies that are put into the mouth. From the same cause the unpleasantness of nauseous drugs may often be lessened or removed by holding the nose while they are swallowed, and a fuller gratification seems to be obtained from wines, especially when sparkling, by the use of wide glasses. So obtrusive is this element of odour in many of the familiar sensations of taste, that some writers have gone to the extreme of holding all flavour to be due to the sense of smell; but this is contradicted by cases in which the sense of smell has been destroyed without the taste being impaired.†

2. Some of the general sensations, called alimentary, also mingle and become confounded at times with pure tastes. By alimentary sensations are meant those excited in the alimentary canal, that is, the passage through which the food is conveyed in the process of digestion. The parts of this canal nearest to the mouth, namely the oesophagus and the stomach, give rise to a variety of

* *Novum Organon*, Book ii., Aphor. 26

† Carpenter's *Human Physiology*, § 744 (American Ed., 1860).

sensations simultaneously with tastes; and it is not always easy to distinguish them from tastes even by attentive observation. The canal is similar in structure, and is immediately contiguous, to the posterior region of the mouth, in which the sense of taste is situated; and as soon as a sapid body is introduced into the mouth, it dissolves in the saliva, its particles in solution find their way into the oesophagus and stomach, and excite the sensibility of these organs. It is scarcely possible, therefore, to determine with exactness where gustatory sensibility terminates, and the sensibility of the alimentary canal begins; so that the sensations of taste are to be viewed as merely the first in a long series of sensations connected with the digestion of food. It is on this account that, whenever any article of food is introduced into the mouth, we feel whether it is agreeable to the stomach or not, that is, we feel the stomachic sensations of relish or nausea.

3. Another class of general sensations, which cannot here be more definitely described than as being of an irritating character, are sometimes confounded with tastes proper. Such are the sensations produced by substances like alcohol, pepper, as well as other spices, and commonly spoken of as *pungent*, *sharp*, or *fiery* tastes. That these are quite distinct from true tastes is evident from two circumstances. (a) Mechanical irritation, such as is caused by a smart rap or a scratch with the finger on the tongue, may excite similar sensations. (b) They can be excited also on other parts of the body besides the organ of taste. Not only is the mucous membrane, which lines the whole mouth, the nostrils, and the alimentary canal, irritable under the action of such substances, but the most powerful of them at least can set

up severe inflammation even in the tougher skin which covers the exterior of the organism.

§ 2.—*Smell.*

(A) The *organ* of this sense is the posterior region of the nostrils. The fact that there are two nostrils brings them into analogy with the organs of the higher senses, which are also double, and which derive an increase of efficiency from this feature. In man, however, the organ of smell is not so highly developed as in some of the lower animals, especially the carnivorous. The cerebral ganglion, from which the olfactory nerve proceeds to the nostrils, is in man a comparatively insignificant bulb of nervous matter, while in those animals it forms a considerable proportion of the whole brain. It may therefore be said that there is more brain-power expended in smelling by those animals than by man. The significance of this fact in comparative anatomy will appear when we come to analyse the perceptions of this sense. It will then be shown that in man the sense has lost in cognitional power, while its emotional side has become predominant.

(B) *Odorous substances* furnish interesting subjects of investigation to the chemist. Without entering into details which have no bearing on psychology, there are two facts worth noticing here.

I. Odorous bodies are either gases, or, if liquids or solids, they must be volatile. Any agent, therefore, like heat, which increases volatility, also intensifies odour. Accordingly, odour is conceived to be due to minute particles, called *effluvia*, emitted by odorous bodies. These particles, being diffused throughout the atmos-

phere, are carried, by the act of inhaling, through the nostrils, where they excite the sensation of smell.*

II. Odorous bodies have all a strong affinity for oxygen; and substances like hydrogen, which do not combine with oxygen at ordinary temperatures, are inodorous. Chemical observations afford ground for believing that the effluvia of an odorous body become oxidised in the nostrils in the act of stimulating the olfactory nerve. It is consequently inferred that the action of bodies on this sense, as on taste, is chemical.

(C) In regard to the *sensations* of smell there is a confusion similar to that which has been already noticed in reference to tastes.

I. Of smells properly so called various classifications have been attempted, but none generally recognised. In fact, the language of common life shows a remarkable absence of names for distinct odours, the only definite distinction being that which is based on pleasantness and unpleasantness—sweet or fragrant perfumes, and stinks or stench.

It has sometimes been asserted that the odour-sense has been evolved within the human race, and even within historical times. But the evidence of comparative psychology is apt to be misinterpreted. The truth is, as already indicated, that, in the transition from the lower animals to man, there has been an increase merely in sensibility to the agreeableness and disagreeableness

* This explanation has been almost universally accepted in science. The only difficulty connected with it is the fact, that highly odorous substances like musk have been known to emit effluvia for years without suffering an appreciable diminution of weight or bulk. But this fact is matched by other evidences of the indefinite divisibility of matter.

of odours, while there has been a diminution in the power of perception by scent—a diminution which seems an instance at once of organic atrophy and of intellectual degeneration, arising from the disuse of a faculty.*

II. But not a few sensations are improperly called odours, because they are in reality sensations of a different class, or mixed with such sensations.

1. *Pulmonary* sensations, that is, sensations connected with the action of the lungs, become inevitably confounded with odours. In the act of breathing, the air, carrying the effluvia of bodies, passes through the nostrils on its way to the lungs; and the sensations awakened arise often as much from the state of the lungs as from the state of the nostrils. This is the case with what are called *fresh* and *close* smells. A close smell is the sensation experienced in an over-crowded assembly or ill-ventilated room, where the vitiated atmosphere does not supply a sufficient quantity of oxygen for healthy respiration. The feeling excited is not merely that of irritation in the nostrils, but a consciousness of depression diffused over the whole animal system, which depends for its vitality at every moment on the æration of the blood through the lungs. On the other hand, some of the most voluminous pleasures of our animal nature are due to the combination of delicious odours with the bracing effect upon all the powers of life arising from the stimulation of cool fresh air. Any one who, after being confined during the heat of a wet summer day, has gone out to walk in a country redolent with the fragrance which the showers have drawn from the sur-

* This is illustrated afterwards in connection with the perceptions of smell.

rounding vegetation, may have recalled the fine ode in
In Memoriam:—

“ Sweet after showers, ambrosial air,
 That rollest from the gorgeous gloom
 Of evening, over brake and bloom
 And meadow, slowly breathing bare
 The round of space, and rapt below
 Through all the dewy-tasselled wood,
 And shadowing down the horned flood
 In ripples, fan my brow, and blow
 The fever from my cheeks, and sigh
 The full new life that feeds thy breath
 Through all my frame, till Doubt and Death,
 Ill brethren, let the fancy fly
 From belt to belt of crimson seas
 On leagues of odour streaming far
 To where in yonder orient star
 A hundred spirits whisper, Peace.”

2. The *alimentary canal* also seems to be affected as much as the nostrils in many so-called smells. Whether this is due to effluvia passing into the canal and irritating its interior coat, or to some nervous connection between the organ of smell and the organs of digestion, is a problem for physiology to solve. Many aromatic substances, however, both solid and liquid, various kinds of flesh when well cooked, especially when highly spiced or flavoured with sauce, undoubtedly excite the stomach, and stimulate the appetite, by their *character*; and it is this that makes the artifices of cookery so valuable when the appetite is not naturally strong. So, too, many smells, by the fact that they are called *disgusting*, indicate that they are irritating to the alimentary canal. When the stomach is already out of order, it is easily thrown into violent nausea by any disagreeable smells; but even in

health some horrible odours, especially when unexpected, produce a disturbance of the digestive organs.

3. *Pungent* smells, like the taste described by the same name, seem to be rather general sensations of an irritating character than smells strictly so called. This may be made evident from two considerations:—

(a) Sensations similar to those excited by snuff, pepper, ammonia, &c., can be produced by mechanical irritation, as, for example, by the sudden contact of the nostrils with a cold atmosphere, or by tickling them with a feather or a straw. This mechanical irritation will even start the spasmodic act of sneezing, which results from the more violent sensations of a pungent character. (b) Moreover, persons who have long indulged in the use of snuff sometimes lose the sense of smell proper, while remaining sensitive to the pungency of their favourite stimulant.

√ § 3.—*Touch.*

(A) In the most general meaning of the term the *organ* of touch is the skin of the whole body, including the membranes which line the mouth, the nostrils, and other internal organs. The skin consists of two layers. The outermost is an insensitve protective covering, called the scarf skin (cuticle, or epidermis). Underlying this is the true skin (cutis vera, or derma), which is sensitive. But the sensibility of the skin to the contact of foreign bodies is dependent on certain minute elevations under the true skin called *papillae*, which are found to be most largely developed in size and number at those parts which are proved by experiment to be most sensitive to touch. It appears, therefore, that different parts of the general organ of touch

possess different degrees of acuteness. To determine the extent of this difference, experiments were first instituted by a distinguished German physiologist, Professor E. H. Weber; and the results, at which he arrived, have been, in general, confirmed by subsequent observers. His aim was to discover at what distance two points could be felt distinct on different parts of the skin. For this purpose, he used a pair of compasses with blunted points; and the persons, on whom he experimented, were blindfolded, to prevent the sight from coming to aid the touch. It is unnecessary here to state in detail the results obtained. Suffice it to say that the most acute parts were found to be the tip of the tongue and the palmar surface of the tip of the forefinger, where the points of the compasses could be felt distinct at the distance of half a line and one line respectively; while on the most obtuse parts, which were proved to be the middle of the back, the arm, and the thigh, the points made two distinguishable impressions only at the distance of thirty lines. It may be observed that these results represent merely the average sensibility, for in making experiments of this sort, it must always be borne in mind, that the same part exhibits various degrees of acuteness in different individuals and even in the same individual at different periods. Moreover, these experiments test merely one form of tactile sensibility; but, as far as touch proper is concerned, all its forms are fairly represented by the sensibility to distinctness in the points of contact.

The most sensitive part of the general organ of touch appears thus to be the tip of the tongue; but in many respects it is obviously incapable of being used for ordinary tactile observations so conveniently as the finger-tips. For delicate observations, however, the

blind are often seen employing the tip of the tongue. With this organ, blind women sometimes thread their needles, and John Gough, the blind botanist, used to examine any plant with which he was not familiar, though he could readily distinguish common plants by the touch of his fingers.* But apart from the obvious inconveniences of such an employment of the tongue, the finger-tips are infinitely better adapted by their position and structure for the ordinary examination of tangible bodies. The numerous joints of the fingers, along with those at the wrists, the elbows, and the shoulders, give an enormous sweep and a great variety of direction to the movements of the finger-tips, while in two respects they exhibit that doubleness which has been already referred to as a characteristic feature in the organs of the higher senses, each hand acting against the other, and the thumb acting against the fingers in each hand. The finger-tips are thus admirably adapted at once for dexterity of manipulation, and for delicacy of discernment in regard to the geometrical and physical properties of bodies. In fact, there is no organ of sense, in which the superiority of man to the lower animals, with their clumsy hoofs and paws, is so definitely marked, as in the organ of touch; and since the time when Anaxagoras declared it to be the hands that make man the most intelligent of animals, it has been frequently observed that there seems to be a proportion between the development of general intelligence and the development of touch in the animal kingdom. †

* Less commonly the lips are used by the blind for accurate touch, as in reading raised type (Levy's *Blindness and the Blind*, p. 58). Dr. Franz's patient sometimes examined objects with the lips (*Philosophical Transactions* for 1841, p. 62).

† An interesting exposition of this proportion will be found in Spencer's *Principles of Psychology*, § 163-4.

To sum up, while the general organ of touch is the skin of the whole body, the special organ of the sense may be limited to the finger-tips. Numerous symbolical actions in which the hand is the chief instrument employed; numerous figurative expressions in which the word hand, or its derivatives, convey the principal idea—to be at hand or on hand, to be in the hands or under the hand of, to lay hands on, hands off! handy, handsome, handsel, handle—the various compounds like *handbook*, *handiwork*, *manufacture*, etc—all these point to a recognition, even by the popular mind, of the fact, that the hand is the conspicuous organ of active intelligence. *

(B) The action of *tangible bodies* contrasts with that of sapid and odorous bodies by being purely mechanical—mechanical pressure. Accordingly, any form of matter, which can exert such pressure, may become an object of touch. Even the air or any gas may be felt, if brought with sufficient force against the skin, as when we are standing against a breeze, or moving rapidly through a

* In connection with the organ of touch the phenomenon of right-handedness deserves notice, though the superiority of the right hand consists rather in its prehensile than in its sensitive power. Extremely divergent views on the source of this peculiarity are still maintained. Some hold that it implies merely a degeneration of the left hand from comparative disuse, and that ambidexterity—double-righthandedness, to use a Hibernicism—might and should be generally cultivated. The science of evolutionism, however, at the present day tends to look upon righthandedness as one of the differentiations naturally arising in the process of evolution, and infers that instances of lefthandedness are merely survivals from an earlier stage of the process. Perhaps the completest discussion of the subject in all its historical and scientific details will be found in a recent dissertation by Dr. Daniel Wilson *On the Right Hand and Lefthandedness* in the Transactions of the Royal Society of Canada for 1886.

still atmosphere ; and instances may be adduced of delicate tactile perceptions by means of the pulse of the air on the face. Liquids also, in so far as they can press against the skin, are tangible. In virtue of the law which requires change or contrast of excitement in order to sensation, a jet of air or water is felt with special ease, as a spot of light or colour becomes peculiarly distinct against a dark ground, or a faint tone is heard most clearly amid a profound silence. By the same law, when any part of the body is at rest in water, the contact of the water is felt only along the line of its surface, as the continued even pressure of a solid on the skin is felt only around the edge. Commonly, however, in the action of gases as well as of liquids on the organ of touch, their temperature is more obtrusively felt than their contact. It is, therefore, the solid condition that is appropriate to this sense.

(C) It is an often-quoted saying of the ancient philosopher Democritus, that all the senses are merely modifications of touch ; and there is a certain amount of truth in the statement, inasmuch as the special senses are all normally excited by the impact of external forces on their organs. On this account touch is sometimes spoken of as the primitive sense of animal life—the rudimentary type out of which all the other senses have been evolved. But this could be held true only of an indefinite sensibility to the contact of foreign bodies, not of the highly specialised touch of man. It has long been recognised that the human sense called by this name combines several forms of dermal sensibility ; and it is scarcely possible for science to define with precision all these varieties.* Of touch, even in its strictest definition, the *sensations* are various.

* At the present day experiments are being carried on, both in

I. Perhaps the simplest and purest form of touch is that, in which a body is felt in mere contact with the skin, without exciting any sensation of positive pressure.

II. Next to this are the sensations which depend on different degrees of pressure. The pressure may arise either from the repulsion of the particles composing a body, or from its attraction towards the centre of the earth. On the sensations thus originated, therefore, is based our knowledge of the comparative hardness and softness, the comparative heaviness and lightness, of bodies. Here, however, touch is supplemented by the muscular sense. In all ordinary instances in which we feel hardness or softness, we squeeze the body between the fingers so as to discover the degree of resistance it offers to the muscular effort of squeezing it; commonly, also, when we feel the weight of a body, we try how much muscular force requires to be exerted by the hands or arms to keep it from being drawn to the earth. Still the touch by itself can feel different degrees of pressure; and the experiments of Weber tend to show that this sensibility of the skin varies in acuteness, at different parts, in tolerably exact correspondence with the sensibility to separate points. ~

III. The last form of tactile sensibility is that which implies pressure at more points than one. From this, as will afterwards appear, we form our perception of the mutual externality of different points. To it we owe also the sensations connected with smooth and rough

Europe and America, which promise some fruitful results in regard to the more exact science of touch. Some account of these experiments, especially of those conducted by Prof. Hall and Dr. Donaldson in the psychophysical laboratory of the Johns Hopkins University in Baltimore, will be found in *Mind* for July and October, 1885, and January, 1886.

surfaces: for if a number of points simultaneously in contact with the skin are felt to be absolutely continuous, the sensation is that of smoothness or fineness; whereas, if the continuity is felt to be broken by minute intervals between the points, the sensation is that of rough or coarse touch. In these sensations, also, touch is usually aided by the muscular sense, by rubbing the finger-tips over the tangible surface.

To guard against misapprehension, it may be well to notice here several sensations which are apt to be confounded with touches, inasmuch as they are located on the skin, and perhaps even the nerves of touch form the organ of sensibility in the case of some.

1. Among the most prominent of these are those irritating sensations which have been already described as *pungent tastes* and *odours*.

2. *Tickling* is another familiar sensation connected with the skin. The nervous condition, upon which this feeling depends, is unknown; and, therefore, it is impossible to tell what makes one part of the skin sensitive to tickling rather than others; but it may be observed that the most sensitive parts, such as the armpits and the soles of the feet, are those of comparatively obtuse tactile sensibility. As a phenomenon in consciousness, however, the sensation is very distinctly marked. In its milder forms it constitutes a pleasurable excitement; but when excessive in duration or intensity, it becomes more or less intolerable. In all forms it is exciting, and is apt to explode in spasmodic actions, such as a sneeze or an hysterical laugh.

3. Another cutaneous sensation of an irritating character is *itch*, which is also clearly defined in consciousness, whatever may be its nervous cause.

4. In this connection ought to be mentioned the sen-

sation of *tingling*, which is popularly described by saying that a limb is "asleep."

5. Lastly, the sensation of the *temperature* of the skin must likewise be distinguished from a touch, properly so called.

§ 4.—Hearing.

(A) The *organ* of hearing is perhaps the most complicated structure of the same size in the human body. Only its most general features can or need be noticed here. It is divided into three parts—the external, the middle, and the internal, ear.

I. The *external* ear consists of two parts:—(1) the *pinna*, that is, the wing-like structure which projects from the side of the head, and the convolutions of which seem to collect the vibrations of the atmosphere for transmission into (2) the *meatus auditorius*, the passage by which these vibrations are conveyed to the interior of the organ.

II. The *middle ear*, called also the *tympanum* or *drum*, is a bony cavity, separated from the auditory passage by a membrane—the *membrana tympani*—and communicating with the mouth, and therefore with the external atmosphere, by means of a passage called the Eustachian tube. This part of the ear contains a chain of three small bones, attached at one end to the *membrana tympani*, and at the other end to a membrane—the *membrana vestibuli*—which separates the middle from the internal ear.

III. The *internal ear* is also a bony cavity, or rather a set of cavities, so complicated in structure as to obtain the name of *labyrinth*. This set of cavities contains a membranous sac—the *membranous labyrinth*—suspended

in a fluid, and attached to the terminal filaments of the auditory nerve.

The ear is thus an organ specially adapted to be sensitive to minute vibrations. Vibratory movements in general, and especially those of a coarser character, are apt to communicate themselves to all elastic bodies, and may thus be transmitted through the atmosphere to objects at a considerable distance. Thus a discharge of artillery will smash glass windows, and shake heavy masonry in the neighbourhood, while its shock can be distinctly felt by the general sensibility of the organism. The rumble of a waggon passing on the street shakes the ground on which we tread, and sends a tremor through all our frame. Even the finer vibration of a wire in a musical instrument may shoot a thrill through the fingers, or through other parts of the body, by which the wire is touched. Ordinarily these general forms of sensibility to vibratory movement are scarcely noticed, because the special sensations of hearing are so much more valuable. But to the deaf such substitutes for the lost special sense are often welcome. Laura Bridgman, who is blind as well as deaf, has often surprised her teachers by the readiness with which she could perceive the vibrations of audible bodies through her hands or even her feet.* In the morning she knew when it was time to rise by putting her finger in the keyhole of a door beside her bed and "feeling"

* *Life and Education of Laura Bridgman*, by Mrs. Mary Swift Lamson, pp. 68-9, 75, 85, 109, 111, 133, 135, 209, 260. Dr. Kitto describes with great vividness his almost morbid sensibility to these general impressions of vibrations on the organism. See the chapter on Percussions in *The Lost Senses*.

the vibration caused by the other girls moving about.* She used to find great enjoyment in a musical box by placing it on a chair with her feet on one of the spars and thus "feeling it play."† She even seemed to take pleasure in the rhythm of a vibration, as she kept time to it herself.‡

The organism in general is thus found to be sensitive to vibratory movements; but this sensibility is immensely increased by being specialised in a particular organ differentiated for this function from the rest of the organism. The essential part of this special organ is evidently the internal ear. The sensibility of the auditory nerve can be excited by merely agitating the fluid with which this part is filled, and thus throwing into vibration the minute nerve-threads which are suspended in the fluid. Thus a person, deaf to all ordinary sounds, may be made to feel, not merely the general thrill of a vibratory movement, but veritable sensations of hearing, by vibrations conveyed to the labyrinth from the bones of the head. A young Scotch lad, named James Mitchell, a blind deaf-mute like Laura Bridgman, showed in his childhood "an eager desire to strike upon his foreteeth anything he could get hold of; this he would do for hours, and seemed particularly gratified if it was a key, or any instrument that gave a *sharp sound* when struck against his teeth."§ In like manner, an ordinary sound may be intensified, if it is conveyed to

* *Ibid.*, p. 191.

† *Ibid.*, p. 331.

‡ *Ibid.*, p. 225.

§ Stewart's *Elements of the Philosophy of the Human Mind*, Vol. III., p. 319 (Hamilton's edition), where an elaborate account of Mitchell will be found.

the internal ear, not only by the ordinary channel of the external and middle ears, but by vibrations in the bones of the head. Thus if a watch, whose tick at the distance of a few inches may be scarcely perceptible, is pressed against the ear or placed between the teeth, the movement of every wheel seems to become audible. Other familiar facts, illustrating this intensification of sound, will readily occur to any one's mind.

But the ordinary mode in which the sensibility of the ear is excited is by vibrations of the atmosphere carried through the auditory passage and the tympanum into the labyrinth.

(B) A *sonorous body* is any form of matter which is capable of exciting atmospheric vibrations. This property of bodies, as well as the collateral property of transmitting atmospheric vibrations, forms the subject of the physical science of *Acoustics*. From that science, as well as from the theory of music, the student of psychology will often find material assistance in studying the mental phenomena of hearing. Such data of these sciences as are required to explain mental phenomena will be noticed in their proper place; but the student is referred, for fuller information, to the most important work on the subject in modern times, Helmholtz's *Lehre von den Tonempfindungen*.*

(C) *Sound* is the general name applied to all sensations of hearing. Like other sensations, sounds vary in *intensity*, the intensity of a sound being what we familiarly call its comparative loudness. This property of sounds

* *On the Sensations of Tone, as a Physiological Basis for the Theory of Music*, by H. Helmholtz, M.D. Translated, with Additional Notes and an Additional Appendix, by Alexander Ellis, B.A. London, 1875.

depends on the breadth or amplitude of the vibrations by which they are produced. If you take a string in a musical instrument and pull it to one side, on letting it go it rebounds to the opposite side, and continues to swing for a while with a gradually decreasing breadth of movement. It will be observed that with the decrease in the breadth of the movement there is a corresponding decrease in the loudness of the sound produced. This explains, among other phenomena, the familiar fact, that a sound, proceeding from a distant body, is fainter than when produced near at hand; for the sound-waves in the atmosphere, like the waves on the surface of water, diminish in breadth the farther they travel.

Besides the physical condition of intensity, there is also an organic condition. It depends on the tension of the membrane of the drum; for the membrane will evidently be agitated less, the more its tension is increased. Any cause, therefore, like yawning, or blowing the nose, which increases the tension of this membrane, deadens sounds. This effect is specially observable on sounds of a grave character, which are produced by long slow vibrations, though it may be scarcely noticed in the case of shrill sounds, that is, those that are produced by short rapid vibrations. Now, the tension of the membrane in question is regulated by two muscles,—the *tensor tympani* and the *stapedius*,—and, by the sensibility residing in these muscles, we must feel to what extent the membrane is tightened or slackened, before we can be aware of the intensity of a sound. In being conscious, therefore, of loudness or faintness, it would seem that muscular, as well as auditory, sensibility is called into play.

While sounds vary by this general difference of intensity, they are distinguishable into two classes by

another very marked difference. The one class are called *tones* or *musical* sounds, the other, *noises* or *un-musical* sounds. The former are produced by isochronous (equal-timed) vibrations, that is, by vibrations which are equal in number in equal times. If, for example, a tone, produced by 500 vibrations in a second, were prolonged for any length of time, it would continue, during every subsequent second, to be produced by precisely the same number of vibrations. On the other hand, the vibrations producing a noise are destitute of any similar periodicity.

Now, tones vary, not only in the general property of intensity, but in a special property termed *pitch*. There is another property which constitutes a difference among tones. It is commonly called *quality*; but on its ultimate analysis, it will be found to be a modification of pitch. These two properties of tones we shall now examine.

1. The *pitch* of a tone is its position in the musical scale, and this is determined by the rapidity of the vibrations producing it. The more numerous the vibrations caused by a sonorous body in a given time, the higher is the pitch of the tone produced. Tones may, therefore, be varied in pitch by an insensible gradation, so that they are not separated by an absolute distinction. But from very early times a scale has been formed in which different tones hold a fixed position in relation to one another. This scale starts from the fact, that there is an easily recognisable interval between tones, when one results from twice the number of the vibrations producing the other. Such an interval is called an *octave*, because the tone at one extreme is *eighth* from the other. The musical scale, therefore, is composed of seven tones, which repeat themselves in ever ascending octaves. The intervals between the

several parts of the octave are not all the same, but the nature of the interval in each case is a subject which must be left for the theory of music. The larger intervals are called tones; the smaller, semi-tones; but these terms want precise definition, as a tone is not necessarily equal to two semi-tones, except in instruments tuned on a peculiar principle. Some people, again, like the Arabs, use even quarter-tones in their music.

The compass of the ear's sensibility to pitch may be roughly estimated as extending over seven octaves, the lowest tone being produced by about 40 vibrations in a second, the highest by about 4000. The seven-octave piano goes down to A of $27\frac{1}{2}$ vibrations, and on larger organs there is even a C of $16\frac{1}{2}$ vibrations; but when these low notes are struck by themselves, a succession of separate pulses is heard rather than a single tone. These notes are, accordingly, used always in combination with notes an octave above, which have the effect of fusing their vibrations into one tone. In the ascending scale the seven-octave piano stops at A of 3520 vibrations; but notes as high as would be represented by about 38,000 vibrations in a second, can be detected by the ear, though with difficulty. Such higher notes, however, are too painfully shrill to be of use for musical purposes, but, if we take them into account, the compass of the ear embraces about eleven octaves.

2. There is another property of tones commonly called in English by the somewhat indefinite term *quality*. For greater definiteness the French *timbre* is occasionally employed for quality, and some recent writers have adopted the term *clang-tint* as a translation of the German *klangfarbe*. By quality is meant the peculiarity that a tone receives from the instrument by which it is produced. If a tone of a certain pitch

and intensity is produced by several instruments of different sorts in succession, notwithstanding the sameness of pitch and intensity, a difference can be detected in the different renderings of the tone. This difference arises partly from causes extrinsic to the tone, such as the stroke of fingers or hammers, or the rush of wind. But after eliminating all such extrinsic circumstances, there remains a certain peculiarity, intrinsic to the tone itself, and distinctive of the instrument by which it is produced. It is this intrinsic peculiarity in the tone of an instrument that is understood by its quality.

In explanation of this peculiarity the fact has been observed, that tones are usually composite. There can be detected in them, not only a prominent fundamental tone which gives its character to the whole, but a series of fainter tones occupying a higher position on the musical scale. These over-tones stand in a definite ratio to the fundamental tone, the first being produced by twice the number of the vibrations producing that tone, the second by thrice, the third by four times that number, and so on by an uniformly increasing multiple. Now, there are a few tones, like that of a tuning-fork, which possess an apparent simplicity, though there is ground for questioning whether even these are absolutely unaccompanied by over-tones; but the rule is, that tones exhibit this composite character. It is further observed that the tones of one instrument are accompanied by over-tones which cannot be detected in those of another; and the conclusion has, therefore, been drawn, that the quality of the tone is determined by its accompanying over-tones. The same fact is also expressed by saying, that the quality of a tone depends on the *form* of its vibrations; for the atmospheric waves, representing its

over-tones, must modify the form of the wave representing the fundamental tone.

§ 5.—*Sight.*

(A) The *organ* of this sense can be more easily described than the ear. The eye is a ball, nearly spherical in shape, the interior of which forms a dark chamber like the photographer's *camera obscura*. The only aperture, by which light can find admittance into this chamber, is the pupil, which shows like a black spot in consequence of the intense darkness of the interior. This darkness is owing to a black pigment in the internal lining of the eye: otherwise the interior is perfectly pervious to light, being filled with transparent humours. Of these humours the most important is called the *crystalline lens*. It lies directly behind the pupil, so that it refracts every ray of light that enters the eye. Being a convexo-convex lens, it brings to a focus the rays of light radiating from objects in front of the pupil, and thus forms an image of these objects on the internal coat of the eye. This coat is called the *retina*, because it is mainly a network of minute fibres from the optic nerve. These nerve-fibres are excited by the rays of light converging upon them, and visual sensation is the result. It remains to be added that the eye is supplied with an elaborate set of muscles, which impart to it that extreme mobility upon which the charm of its expressiveness depends. In consequence of the muscular sensibility thus added to its own special sensibility, the value of the eye, as an organ of sense, is immensely increased.

(B) The *agent*, therefore, in visual sensation is light, that is, light considered as a physical fact, not as a fact of consciousness. Physically considered, light is con-

jectured to be an inconceivably rapid vibration of an elastic ether diffused throughout space. Light is either original or reflected. In the former case, it originates in the body from which it comes to the eye, as in the sun and in terrestrial bodies at a high temperature. In the latter case, the body, which throws light on to the eye, derives it, mediately or immediately, from some original source of light. The light, which is thus reflected by a body, does not always render the body visible. If the body is a mirror, and the mirror is perfect, it reveals, not itself, but the objects in front, which throw on to it their original or reflected light. Except in the case of mirrors, reflection makes the reflecting body itself visible. In order to visibility a body must be more or less opaque. A perfectly transparent substance, allowing all the light which falls on it to pass through it, reflects none to the eye; so that it fails to stimulate the sensibility of the retina, and no vision takes place.

(C) The *sensations* of sight are those of pure light and of colour.

I. As a phenomenon in consciousness *pure light* appears simple, though its physical cause may, in a certain sense, be said to be composite: it may be decomposed by a prism into the colours of the spectrum; and these colours, by being combined, produce again the single sensation of pure or white light.

II. *Colours* admit of an indefinite variety of modification; but their variations run along either of two lines, tone and depth.

1. *Tone* is the name given to the position of a colour on the spectrum or rainbow. If a sunbeam is made to pass through a prism, and caught by the eye or thrown on to a screen, it may be observed that it is broken up into a bar of variegated hues: this bar is technically

called a *spectrum*. On careful observation it is found that, even though there are occasional dark lines crossing the bar, its hues merge imperceptibly into each other ; but the extreme points are seen to be occupied by a line of red and a line of violet, while a green line distinguishes the centre. Between the red and the green two prominent types of colour may be marked—an orange and a yellow. At the other end indigo and blue lie between the violet and the green. The spectrum is, therefore, commonly divided into seven parts,—red, orange, yellow, green, blue, indigo, violet. But the colours, red, green, and violet, occupying the three most prominent places on the spectrum,—its centre and its two extremities,—are distinguished by the name *primary*. The four intermediate colours, orange and yellow, blue and indigo, which can be produced by combinations of the primary colours, are called *secondary*.

The division of the spectrum into seven tints has, not unnaturally, led to some ingenious speculations aiming at the establishment of an analogy between the so-called tones of colour and the seven tones on the musical scale. Whatever success may ultimately attend speculations of that drift, it is certain that even yet science is far from a fixed definition of the different colours, such as was reached long ago in the distinction of musical tones. In recent times, indeed, attempts have been made by physicists to establish a scientific nomenclature of colours by dividing the spectrum into definite parts, and assigning a specific colour-name to each. But the common names of colours in all languages are applied with that vagueness which might be expected from the fact, that there is no absolute line of demarcation between the different tints on the spectrum. This vagueness may be

due also to the circumstance, that colour-names in general seem to have been originally the names of familiar objects which naturally display certain colours,* while these colours, like that of the sea, for example, are apt, under various natural influences, to modify their tone considerably from hour to hour, from day to day, and from one season of the year to another. The common names of colours must, therefore, be interpreted as covering each a considerable breadth on the spectrum, and as applicable, in consequence, to a considerable variety of tints. Accordingly, it is not a matter for surprise that colour-names should occasionally be employed with such latitude that they seem to be tossed at random over all sorts of natural phenomena. This want of exactness in the designation of colours forms the sole plausible ground for a recent hypothesis, that the sensibility to differences of colour, so far from being a possession of the lower animals or of primitive man, has been developed in the human race within comparatively recent times.† The hypothesis, however, vanishes before a critical exegesis of the ancient authors in light of the fact, that, in consequence of the imperceptible gradation of the colours on the spectrum, their names must be employed with a considerable latitude.‡

* This etymology is illustrated at length in Mr. Grant Allen's *Colour-Sense*, chap. xiii. But the theory is perhaps too sweepingly stated. It seems an accepted doctrine among philologists, that word-roots primitively express an impression of sense; and it remains still to be made out, that in no instance has a colour been the attribute primarily determining a name.

† See Geiger's *Zur Entwicklungsgeschichte der Menschheit*, iii., and an article by Mr. Gladstone in the *Nineteenth Century* for October, 1877.

‡ Mr. Grant Allen's work on the *Colour-Sense* is largely occupied with a criticism of this hypothesis.

The problem of the difference of colour presents a physical and a physiological, as well as a psychological aspect. (a) So far as it concerns physics, the problem is solved by an application of the physical theory of light. On that theory, as already explained, light is conceived to be the vibration of an ethereal form of matter diffused throughout space; and the difference of colours is conceived as due to the varying velocities of the ethereal vibrations. At the red end of the spectrum it is calculated that the light-waves amount to 451 billions in a second, while with increasing velocity they produce the other colours, till they attain the number of 785 billions in a second at the highest limit of vision, where the violet rays appear. (b) The problem of the physiologist is to explain the effect of light on the organ of vision in such a way as may account for the various sensations of colour. Here, however, science has not yet attained the general agreement which prevails in regard to the physical source of the difference in colours. One theory maintains that the physiological explanation of this difference is to be found, not in a functional variation, but in organic structure. The conjecture is, that the terminal filaments of the optic nerve, which go to form the retina, are of three kinds at least, corresponding to the three primary colours, and that each set of retinal fibres reacts only under the impulse of the colour-rays, to which it is adapted. This theory was suggested long ago by Young, and has been extensively adopted in recent times, especially under the influence of Helmholtz; but it meets with opposition from physiologists so eminent as Wundt. The psychologist must, therefore, wait for further advance in the physiology of vision, before he can make use of any facts connected with the organic action of light to explain the

difference of colours. (c) With regard to the psychological aspect of this difference more will be said in the sequel, when illustrating the function which colours perform in developing our mental life. Suffice it to observe at present a fact, the import of which will afterwards appear, that the colours at the red end of the spectrum belong to the exciting class of sensations, whereas they acquire a calmer tone as we pass towards the opposite end.

2. A second variation of colours arises from their *depth*. It is unfortunate that the term *intensity* has been applied to the depth of colours; for this term, as already explained, is the universally recognised technical expression for the force with which a sensation obtrudes itself in consciousness. Like all sensations, those of sight vary in intensity, as a matter of course; and of these variations an exact measurement is attempted in different ways by means of the various instruments, to which the name *photometer* is applied. But what is meant by depth of colour is that peculiarity which is sometimes expressed by speaking of one tint as *darker* or *lighter* than another. These expressions indicate the source of this peculiarity. It arises from colours being diluted with pure light in different degrees. Thus a *dark blue* is comparatively undiluted, while a *light blue* is comparatively diluted, with pure or white light.

For further information on all subjects connected with vision, the student is referred to another great work of Helmholtz, *Handbuch der Physiologischen Optik*.

CHAPTER III.

THE GENERAL SENSES.

THE various forms of the general sensibility, which have been named in an earlier chapter* the general senses, were there distinguished from the special by the circumstance, that they have no organs specially adapted for the production of their sensations. Their organs are simply the organs of the body in general, in which the ramifications of the nerve-fibres are distributed. These organs are primarily adapted to the lower functions of animal life ; but in subserving these functions they give rise to the higher function of sensation, and thereby become organs of sense. In consequence of this the classification of general sensations is beset by a difficulty which is scarcely felt in the case of special sensations. It is true, as was shown above in several instances, the unscientific consciousness occasionally confounds the sensations of different special senses ; but, as a rule, these sensations can be readily distinguished and referred to the organs, from the affections of which they arise. It is not so, however, with the general sensations. They are often so obscure in their nature, that they can neither be clearly distinguished in consciousness, nor precisely localised in the organism. This, in fact, is no slight cause of the difficulty a physician experiences in

* Chapter I., § i.

forming a satisfactory diagnosis of a disease. The sensations of disease are connected mainly with the general sensibility. The patient commonly feels but a vague uneasiness, which he is unable to describe or localise; and fortunate will it be, if he does not mislead his medical adviser by an illusory description of its nature and locality. In consequence of the characteristic vagueness of these sensations it will be found that they possess in general comparatively little value as sources of knowledge; it is as sources of feeling—of our pleasures and pains—that they are most obtrusive in consciousness.

In the absence of that clear definition which is necessary to a scientific classification of the general sensations, we must perhaps content ourselves with a provisional enumeration of their principal varieties. But even in such an enumeration we must be guided by the principle which governs the classification of the special sensations,—we must follow the distinction of the bodily organs, keeping in view at the same time the conscious distinction of the sensations excited. For the purpose of reducing to some sort of order the complex variety of phenomena to be enumerated, it may be convenient to separate them into two groups. For some of the general sensations approach more nearly the character of special sensations, inasmuch as they arise from the action of a particular organ or set of organs. Such, for example, are the muscular and the alimentary sensations, which are excited respectively by the action of the muscles and of the alimentary canal. Others, again, like the sense of temperature, instead of being limited to a single organ, are distributed more or less over the whole sentient organism; and these may, with some propriety, be regarded as general sensations in the most restricted meaning of the term.

§ 1.—*General Sensations connected with one Organ.*

Of this class the feelings derived from the exercise of the muscles are, in many respects, by far the most important; the muscular sense may, in fact, claim the rank of a sixth special sense. We shall accordingly treat it with the same detail as the special senses.

i.—*The Muscular Sense.*

In earlier times this form of sensibility was usually confounded with touch. It is true that, as far back as the seventeenth century,* some writers had recognised the fact that certain feelings, such as weight, commonly ascribed to touch, must be due to a totally different sense; yet it was not till a comparatively recent date, that the distinction of muscular sensibility was generally accepted in psychology.

Even at the present day there is considerable variation of opinion among physiologists as to the precise nature of the organic process in muscular feeling. The various opinions on the subject may be conveniently ranged under three heads. There are those who find, in the nerve-fibres that are imbedded among the muscular tissues, a special apparatus of sensation, affording a sufficient physiological explanation of the feelings of muscular exertion. Others, again, refuse to ascribe any independent sensibility to the muscles; and they explain the feelings excited by muscular action as being due either

* A history of the discovery of this sense is given in a learned and interesting note by Sir William Hamilton, in his edition of Reid's Works, p. 867. For more recent doctrines on the subject, see Wundt's *Physiologische Psychologie*, vol. i., pp. 376-8 (2nd ed.), and an article on *The Muscular Perception of Space*, by G. Stanley Hall, in *Mind* for October, 1878.

to a peripheral cause, such as the resulting movement of the skin and adjacent tissues, or to a central stimulus,—the stimulus of the brain implied in volitional effort. Perhaps a complete physiological explanation will accept something from each of these theories. By this mode of reconciling the divergent opinions, a distinct organ of sensibility is recognised in the structure of the muscles, while it is admitted, as it may be in the case of all the senses, that sensations excited by this organ may be associated with other sensations excited at the same time, and that the resulting consciousness may be a fusion of various co-existent sensations. But the psychology of muscular sensibility is not called to decide between rival physiological theories on the subject; it postulates as its data merely certain distinguishable forms of sensation connected with the action of the muscles.

(A) The special *organ*, then, of the muscular sense is the muscular tissues. These are, both in an anatomical and in a psychological point of view, of two kinds. In anatomical structure, some are distinguished by minute transverse bars or stripes, for which they are said to be *striped*, while others are called the *unstriped* muscles owing to the absence of this feature. Again, some muscles are under the control of the will, and are therefore named *voluntary*, while others are distinguished as *involuntary* in consequence of their being beyond the will's control. Now, the voluntary muscles are all striped, and the unstriped are all involuntary; but a few involuntary muscles, such as those of the heart, are striped.

It is the voluntary muscles that form the organ of muscular sensation proper. These muscles are supplied both with afferent and with efferent nerves, so that in their structure they exhibit all the features necessary to an organ of sense.

(B) In regard to the *agency* by which the muscular sense is excited, it differs from the special senses in their normal action. We have seen that these senses are usually stimulated by forces external to the organism; in the case of the muscles, it is their own specific action that produces their sensations. The function, to which the muscles are specially adapted, is the production of motion; and this they produce by the peculiar property with which they are endowed. This property is called their *contractility*. It is a peculiar power of shortening their tissues, so as to pull those parts of the organism to which they are attached.

(C) *Muscular sensations*, properly so called, are therefore the sensations excited during the peculiar action of the muscles; and the term is not to be understood as including sensations excited by any condition of muscular tissue besides its contraction. In this restricted sense, the muscular sensations are divisible into two classes, comprehending respectively the sensations of simple tension and those of motion.

I. The former class includes all the feelings excited by a muscular strain that does not pass into living movement,—a “dead strain,” as it is called. Such feelings are experienced when supporting the body, especially in an upright posture. Other examples are found in the support of an external weight, or in the effort of merely resisting any force, as well as in the push against an insuperable obstacle.

II. The second class comprehends the sensations excited by a muscular effort which results in movement. The only marked difference among this class of sensations is founded on the varying rapidity of the motion produced. The sensations of rapid movement are more exciting, while those of slow movement belong to the

palmer type. For this reason, as will afterwards appear, the latter class afford more valuable materials for knowledge; and the same may be said regarding the sensations of a dead strain. The sensations of rapid movement, on the other hand, are more powerful stimulants of feeling,—of our pleasures and pains.

It remains to be added, that in our mental development the muscular sense is of value, not merely in itself, but also as an aid to the other senses. This has been already noticed incidentally; but in the analysis of our perceptions it will appear more clearly that, not only in touching, but also in tasting and smelling, in seeing and hearing, the acuteness of perception is largely increased by muscular activity and sensibility. And it will thus be seen that, as was observed before, the body is the organ of the soul, not simply as the passive recipient of external impressions, but also in virtue of its active power.

Muscular exertion stimulates respiration; and therefore muscular sensations, especially of the intenser sort, are apt to be mingled with the sensations of the next class.

ii.—*The Pulmonary Sensibility.*

This class comprehends those sensations which may be called pulmonary, inasmuch as they are connected with the action of the lungs. They have been already noticed as mingling with olfactory sensations in what are known as *fresh* and *close* smells. The lungs do not obtrude their normal action into consciousness; but more or less distinct sensation is excited by any marked variation in their action, arising from any unusual stimulant or impediment. Thus we feel the influence of any cause which, by increasing the supply of oxygen to

the lungs, stimulates the respiration. This is one of the effects experienced from the fall of the thermometer ; and it is partly in consequence of this, that the breathing of cool air is felt to be "bracing," though the effect of cold on all the bodily tissues must not be overlooked in explaining the general feeling of exhilaration described by this term. A similar stimulation is felt in facing a breeze, in passing from a confined atmosphere to the open air, or in brisk muscular exercise. These sensations, however, cannot, from their very nature, be limited to the lungs. The accelerated oxidation of the blood, with which they are associated, stimulates all the vital processes, and produces, in consequence, a feeling of intensified vitality throughout the whole animal system.

"O there is sweetness in the mountain air,
And life which bloated ease may never hope to share!"

On the other hand, any impediment to the healthy action of the lungs produces a feeling of depression, which diffuses itself rapidly over all the functions of life. This feeling may vary in all degrees from the comparatively mild torpor induced by breathing a somewhat vitiated atmosphere up to the terrible agony of suffocation.

iii.—*The Alimentary Sensibility.*

Another group of sensations to be noticed in this section are those connected with the alimentary canal. There is a great variety among these sensations, corresponding, partly, to the different regions of their organ, partly to the different stages in the process of digestion, which is its function. Connected with the earliest stages of this process, the mastication and salivation of food in the mouth, as well as its solution under the action of the gastric juice in the stomach, there

are those pleasant sensations of relish, and the pleasant sensations of nausea or disgust, which have been already referred to as being sometimes confounded with tastes and smells. During the unimpeded performance of its functions the alimentary canal does not obtrude itself upon consciousness in the form of any definite sensation. Healthy digestion is, indeed, accompanied with a feeling of comfort, extremely luxurious though vague; but this feeling is evidently diffused so extensively over the whole animal system, that it cannot be regarded as a sensation of the alimentary canal exclusively, though this organ may be its primary source. On the other hand, indigestion gives rise to a great variety of disagreeable sensations, deriving their various characters from the nature of the interruptions from which they proceed, but seldom, except in milder cases, confining themselves to the alimentary canal. Moreover, when the food has been digested and absorbed, the want of a new supply produces the familiar sensations of hunger. But this sensation also, though, in its earlier stages, definitely localised in the stomach, tends, when prolonged, to spread into a dreadful state of general suffering that obliterates the sense of its original source.

iv.—The Sensibility of Other Organs.

It must not be forgotten that the remaining organs of the body, such as the bones, the ligaments, the arteries and veins, are sensitive; but the sensations, of which they are the source, are either so completely fused with concomitant sensations of other organs that they cannot be distinctly defined, or their sensations are essentially similar to those which may be experienced in all the organs of the body, and are therefore referred to the next section. The only exception is the sensations derived

from the distinctive organs of the sexes ; and these sensations, if they admitted of a detailed treatment, might be shown to form a very important factor in the *psychology* of the human mind.

§ 2.—*General Sensations, not limited to Particular Organs.*

The sensations belonging to this section have already been described as peculiarly deserving to be styled general sensations. Besides the fact that they cannot be defined by their association with separate organs—perhaps in consequence of this fact—they possess, in a high degree, that characteristic vagueness which contrasts most of the general sensations with the special. This renders it impossible, in the present state of psychology, to attempt anything like an exact or exhaustive classification of these sensations.

I. The most obtrusive in our daily consciousness appear to be the sensations of *temperature*. Animal tissues, like all other bodies, are subject to the expansion and contraction which result from the rise and fall of temperature ; and it has been supposed that this action on the nervous tissues affords a sufficient physiological explanation of the feelings of heat and cold, though some physiologists have held that the sensibility is due to a special set of nerves.* Whether the sensibility to temperature be, as this theory supposes, a special sense or not, it certainly is not limited to any single part of the organism. The feeling of

* Recent investigations seem to show that this sensibility is distributed sporadically over the skin, different spots being sensitive to heat and cold. See *On the Temperature-Sense*, by Dr. H. H. Donaldson, in *Mind* for July 1885.

heat or cold may, indeed, for the moment be localised in some particular region of the body; but it may equally well, at another time, be confined to a different region, or diffused generally throughout every part, internal and external. As the sense of temperature must be affected mainly by the temperature of the environment, it is probably the skin, either in general or at some definite part, that is most frequently the seat of warmth or chill. But these sensations, though thus associated with the organ of touch, must not on that account be considered tactile; for not only are the two kinds of sensation wholly distinct in character, but the parts which are most sensitive to touch are not proportionally sensitive to temperature. In connection with the relation of touch to the sense of temperature, a somewhat interesting fact may be mentioned. Suppose a part of the skin endowed with an acute sense of touch is brought into contact with a part comparatively obtuse, then, unless an effort of attention interfere, the acute part feels most prominently the touch of the obtuse, while the latter feels most prominently the temperature of the other. If the brow, for example, is feverishly hot, and the hand chilled, it is pleasant to feel on the brow the coolness of the hand, which does not so perceptibly realise the temperature of the brow. So, too, the warmed hand is often applied to the face, when suffering from any neuralgic affection which is relieved by heat.

II. Another very extensive group of sensations may be described somewhat indefinitely as due to abnormal or, at least, unusual conditions of the various bodily tissues.

1. Diseases and injuries may be mentioned first among these abnormal conditions. Some organs, like the bones and ligaments, never affect our consciousness, except

under such unusual influences as a rupture, a fracture, or some kind of internal decay. The muscles, also, are the seat of many painful sensations in cases of laceration, bruising, or cramp. The condition of nerve-tissue, in health, can scarcely be said to appear in consciousness, except, perhaps, in a vague sense of general well-being; but one of the most unendurable forms of acute pain is that which arises from a diseased state of some nerve, and which is therefore appropriately described by the name of *neuralgia* (*nerve-ache*).

Perhaps the sensations of fatigue ought to be included among those arising from an injured condition of bodily tissue; for these sensations become obtrusive in consciousness only when the limit of health is being transgressed in the action of any organ. These sensations may, indeed, in earlier stages, assume the form of a mild lassitude, which is just sufficient to give a zest to repose; but even then they are to be taken as a warning, that the action of the fatigued organ cannot be continued with impunity. It is the sensations arising from excessive and irksome muscular toil, that fill the cup of daily misery in the life of the overwrought poor. But probably the most intolerable sensations of weariness are those which have their origin in the excessive waste of nerve-tissue produced by prolonged periods of sleeplessness, of intense emotional excitement, of severe intellectual labour, or—what is still worse—of all these combined.

2. The abnormal conditions of animal tissue, which are thus found to be the source of sensation, may be produced by the application of various substances. Powerful irritants, like peppers, acids, ammonia, or alcohol, have been already referred to as setting up an inflammatory action on the skin and other parts of the

body. But the various substances, designated as poisons, are those which play the strangest freaks with human sensibility, apparently by their action on the nerve-tissues. The term *intoxication*, if its original meaning be kept in view, might be used to describe the sensations arising from the action of poisons. But the term commonly implies, what must be obvious to every observer, that the influence of these substances extends at once to the highest nerve-centres, resulting often in the most startling effects upon intellect and emotion. It seems impossible, therefore, to eliminate these phenomena of intellectual and emotional elevation or depression, arising from the stimulating or narcotic action of poisons, so as to define their effect on the mere sensibility.

3. Among the influences originating unusual conditions of nervous tissue, electricity and magnetism demand a place. The artificial application of electricity produces a well-marked kind of feeling, the spark from a Leyden jar startling the subject of the experiment with an acute shock, while the Voltaic current pours a continuous thrill of wrenching sensations. On the other hand, the influence of the natural electricity on the nervous system is by no means so well marked. It appears only when there are considerable disturbances in the electrical state of the atmosphere, or in the earth's magnetism, as during thunderstorms or earthquakes. It is also limited to very vague effects in consciousness, with which probably psychical processes of an intellectual or emotional kind are intermingled. Moreover, these effects appear to depend largely on individual peculiarities of nervous temperament: in some persons they take the form of an inexplicable elevation, in others that of an equally inexplicable depression. In a cold dry climate like that of the Canadian winter, where animal

electricity is sometimes developed with extraordinary power, there appear to be no definite electrical sensations experienced, except when a spark is drawn by the touch of a conductor.

Since the time of Mesmer and Von Reichenbach the influence of animal electricity and magnetism has often been connected with some of the strangest phenomena in the psychical life of man ; but the attempt to establish this connection raises a problem which can be conveniently discussed only at a later stage.

PART II.

THE MENTAL PROCESSES.

THE phenomena of mind resemble the phenomena of matter in the fact, that ordinarily they are of a complex character. The elementary constituents of mental phenomena, described in the previous Part of this Book, are not found in distinct isolation in our ordinary consciousness; they are separated only by scientific abstraction,—by analysis. The combination of these elements into co-existent groups or consecutive series, however capricious it may seem to a careless observer, is found, on more accurate inquiry, to be due to certain determinate processes which are governed by invariable laws. These processes are Association and Comparison. They form the subject of this Part.

CHAPTER I.

ASSOCIATION.

TO understand this process it must be observed that the elements of mind may not only make their appearance in consciousness, under the conditions explained in the previous Part, but may re-appear any time after, generally in a fainter degree, when these conditions no longer exist. Such a re-appearance of any mental state is appropriately named a *representation*, while its original appearance in consciousness is called a *presentation*.* A former state of mind is thus represented in consciousness in consequence of a certain relation existing between it and the mental state immediately preceding the representation. This relation is technically named an *association*. The act, by which the preceding mental state evokes a representation, is called, in technical as well as in ordinary language, *suggestion*. The conditions under which this act is performed, are therefore called the Laws of Suggestion ; but, as suggestion is founded on an association between the suggesting and the

* This revival of former presentations implies of course that they have not been altogether lost, that they have been retained in some way as a possession of the mind. In the present state of science such retention must be accepted simply as a fact, though various hypotheses have been proposed to account for it.

suggested states of mind, these laws are sometimes named also the Laws of Association. Of these laws some are distinguished as *primary*, others as *secondary*. The difference between these will be more easily comprehended after the explanation of the former class.

§ 1.—*Primary Laws of Suggestion.*

In their highest generalisation these laws are reducible to two.

- I. *The Law of Similarity or of Direct Remembrance*.—States of mind, identical in nature, though differing in the time of their occurrence, are capable of suggesting each other.
- II. *The Law of Contiguity or of Indirect Remembrance*.—States of mind, though differing in nature, if identical in the time of their occurrence, are capable of suggesting each other.

These two laws evidently comprehend all possible cases of suggestion, as they apply both to phenomena which are identical and to those which are different in nature. The first law requires in order to the possibility of suggestion, that there be a natural resemblance between the suggesting and the suggested states of mind. Thus, when I hear a sound which I recognise as the voice of a friend, the recognition implies that the sound of the present moment suggests to me the sound of the voice heard before. Now, the two sounds are similar in their nature; they differ merely in the time of their occurrence, the one being heard now, the other having been heard on some previous occasion. The two sounds therefore, fulfil the conditions of the first law. But the act of which we are speaking, the recognition of a sound as being

a friend's voice, implies something more. Not only does the present recall the former sound, but it recalls also the friend's appearance, with which that sound is associated. Now, there is no natural resemblance between a man's visual appearance and the sound of his voice; but the two have, by hypothesis, been in the mind at the same time. They, therefore, fulfil the conditions of the law of contiguity, and the one is thereby capable of suggesting the other.

Such is the general purport of the primary laws of suggestion. The nomenclature, by which they are distinguished, can scarcely be said to be determined among psychologists. The names Similarity and Contiguity are those adopted, perhaps most commonly, in English psychological literature. The other names, Direct and Indirect Remembrance, were given to the laws by Sir William Hamilton.* Perhaps they were suggested by the expressions *immediate and mediate Reproduction*, used by Herbart. † But whatever their origin, their significance, which will appear in subsequent expositions, has been unfortunately overlooked by English psychologists. The phrase, *intrinsic and extrinsic association*, ‡ might be introduced very appropriately to distinguish associations founded on an intrinsic resemblance of mental

* See his dissertation appended to *Reid's Works* (Note D. * * *, pp. 912-3). It is a matter of regret that this dissertation was never finished by its author, and that his theory of suggestion was therefore never brought into complete shape.

† *Unmittelbare und Mittelbare Reproduction* (*Werke*, Vol. v., pp. 24-5). These terms are used also by Lotze (*Mikrokosmos*, Vol. i., p. 236; and *Grundsätze der Psychologie*, p. 22).

‡ Thus I would translate Wundt's *innere und äussere Association* (*Physiologische Psychologie*, Vol. ii., p. 300, 2nd ed.).

states from those which imply merely the extrinsic accident of simultaneous occurrence in consciousness.

Although the general drift of these laws may be indicated by the above explanation, yet the full bearing of their influence in the processes of mind requires a more detailed exposition. Such an exposition may be conveniently given in connection with certain forms of suggestion, which were supposed by old psychologists to be independent laws, but which may be shown to be merely resultants of the two more general laws under consideration.

i.—*Suggestion by Local Association.*

To the ordinary observer of what is passing in his mind, there is perhaps nothing more obvious than the fact that things are apt to suggest one another, if they have been associated in place; and therefore this mode of suggestion was noticed even by the earliest inquirers. Among the multitude of phenomena illustrative of this principle there are two which possess a special interest.

I. Local Association is the link by which mental states seem to be most easily connected, and by which therefore they suggest each other with the greatest readiness. The reason of this will be considered again. Here it may be observed that the great mass of the knowledge, which we acquire naturally, is given through the senses, especially through the sense of sight, and the idea which we form of an object is, wherever possible, a visual image. Consequently, it is natural that the easiest transition between mental states should occur when they have such a local relation as to form parts of one visual picture.

On this account local association forms a predominant power of suggestion in minds that have not been

disciplined to methodical habits of thinking ;* and even in men of cultured intelligence the train of thought is directed along this line, when mental discipline is relaxed under the indolence of reverie, or the general decay of old age. Then a simple story cannot be told without introducing a number of circumstances, which have only a local connection with it, and by which, accordingly, its point is often concealed, and its interest flags. It has been mentioned as an indication of the genius of Shakespeare, that he guides the talk of uneducated characters along the track of local associations. "Thou didst swear to me," says the Hostess in *Henry the Fourth*,* upon a parcel-gilt goblet, sitting in my Dolphin-chamber, at the round table, by a sea-coal fire, on Wednesday, in Whitsun' week, when the Prince broke thy head," etc.

In consequence of the readiness with which thoughts are suggested by local association, it has been made the basis of many systems and artifices for aiding the memory. Mnemonic systems of various plans have been invented since the time of Simonides, in the sixth century B.C. ; but their ingenuity has generally been too artificial to render them of much service. Still there are several simple expedients by which local contiguity may be used to make recollection easier. Of these the most familiar and the most useful are tabular views and genealogical trees. Thus an elaborate classification, which could be mastered only with great labour and, perhaps, uncertainty, if we depended entirely on the relations of resemblance

* Apparently associations of locality are strong also among some of the lower animals, at least in the domestic state, such as the horse, the dog, and the carrier-pigeon.

† Part ii., Act ii., Scene 1.

or causality between its parts, may be committed to memory with comparative ease by arranging them in a tabular view, that is, by placing them in local association with one another.*

II. Another fact to be observed in connection with this power of suggestion is, that a place may recall, not only another place or a material object in its neighbourhood, but also any thought or emotion which has been experienced there. It is by such associations that localities come to wield such an influence over the feelings and the actions of men. In all settled communities the power of "home," especially over the inner life of individuals, has become a familiar theme for literature. But an influence of wider sweep is acquired by places that have become associated with the lives of great men or with great events in the history of the world. It

* The recognition of this fact has been common among writers of all times. "When things to be remembered are so placed, that the relation of contiguity concurs with those of similitude, cause and effect, in leading the memory from one to another, the task of recollection may be performed with proportional ease" (Ferguson's *Principles of Moral and Political Science*, Part i., Chapter ii., § 6). "Quicquid deducat Intellectuale ad feriendum Sensum (quae ratio etiam praecipue viget in artificiali memoria) juvat Memoriam" (Bacon, *Novum Organon*, ii., 26). "Vidit hoc prudenter, sive Simonides, sive alius quis invenit, ea maxime animis effingi nostris, quae essent a sensu tradita atque impressa; acerrimum autem ex omnibus nostris sensibus esse sensum videndi; quare facillime animo teneri posse ea, quae perciperentur auribus aut cogitatione, si etiam oculorum commendatione animis traderentur" (Cicero, *De Oratore*, ii., 87). This discovery, thus ascribed doubtfully to Simonides, is connected in tradition with a well-known beautiful myth in the poet's life. See also Quintilian, *De Orat. Inst.*, xi., 2, where detailed illustrations are given of the "topical memory" based on local association.

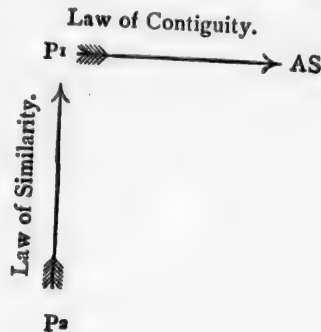
is an often-quoted saying of Johnson's, that "that man is little to be envied whose patriotism would not gain force upon the plain of Marathon, or whose piety would not grow warmer among the ruins of Iona."* It is this that forms to Americans the charm of travel in the Old World. It is thus that the church or temple,—the building or locality,—set apart for worship, becomes associated in the devout mind with the purest thoughts and the highest aspirations of his life, so that it grows suggestive to him of a sacredness which can be at best but clumsily symbolised in any ritual of consecration. Any locality, which has taken a position in the history of a good man, becomes powerful to stimulate aspirations after the saintliness of his life; and this imparts its religious significance and justification to the practice of making pilgrimages to the shrines of saints. The great series of events, known by the name of the Crusades, in which the conflict of Christendom and Islam found its most vivid and enthusiastic expression, forms a striking example of the part which local associations have played in directing even the grander movements of the world's history.

Such are a few illustrations of this suggestive force: it remains for us now to analyse it into the two more general laws of Direct and Indirect Remembrance. In order to do this it must be observed that, in all cases of suggestion by local contiguity, there must have been a cognition, whether a presentation or representation, of some locality, and co-existing with it in consciousness, there must have been either a cognition of something in the neighbourhood, or

* Journey to the Hebrides.

some thought or emotion, or other state of mind. These mental states, having been contemporaneous with the cognition of the locality, fulfil thus the conditions upon which the law of Indirect Remembrance depends: however different in nature they may be from the cognition of the locality, they do not differ from it in the time of their occurrence. Now, when the locality is subsequently presented or represented, this subsequent cognition is identical in nature with the previous cognition, differing from it only in the time of its occurrence, so that the later cognition suggests the earlier by the law of Direct Remembrance.

The combined operation of the two laws may be illustrated by the following diagram, in which P_1 symbolises an earlier cognition of any place, P_2 a subsequent cognition of the same; while AS is a symbol for mental states associated with the former cognition, and the arrows point in the line of suggestion. The diagram



also illustrates the fact, that the Law of Similarity is the fundamental principle of suggestion, inasmuch as mental states are recalled by it directly or immediately, but only indirectly or mediately by the Law of Contiguity.



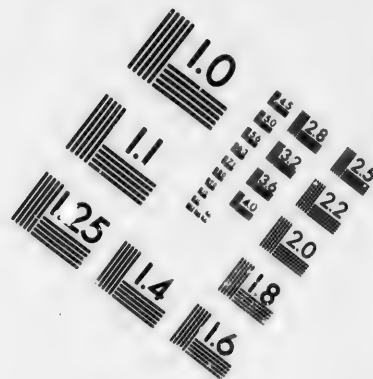
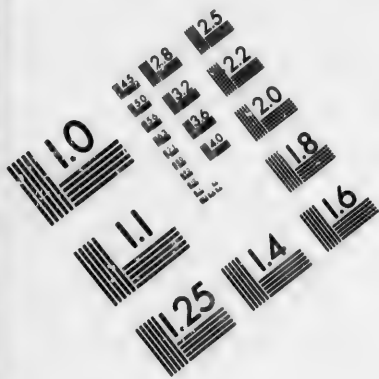
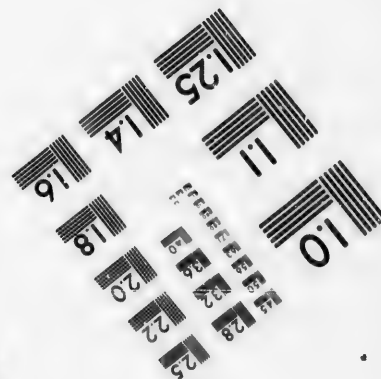
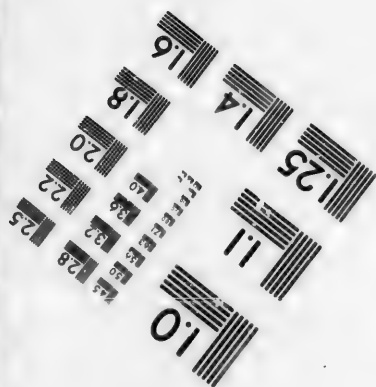
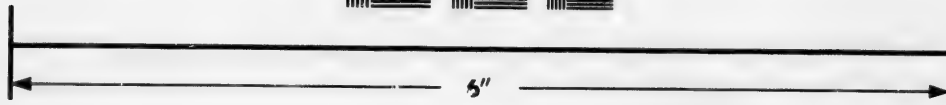
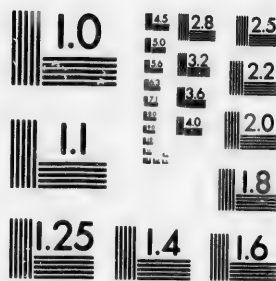


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic
Sciences
Corporation

33 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
7.1
8.0
9.0
10.0
11.2
12.5
14.0
16.0
18.0
20.0
22.5
25.0
28.0
31.5
36.0
40.0
45.0
50.0
56.0
63.0
71.0
80.0
90.0
100.0

0.1
0.2
0.3
0.5
0.7
1.0
1.5
2.0
3.0
5.0
7.0
10.0
15.0
20.0
30.0
50.0
70.0
100.0

ii.—Suggestion by Resemblance.

This force of suggestion is scarcely less obvious than the preceding, and has therefore been long familiar to students of the mental processes. It is not, however, so readily suggestive as local associations, and, accordingly, is not so characteristic of vulgar minds. On the contrary, its presence, as a powerful and frequent energy in determining the course of thought, is one of the most obvious evidences of intellectual culture. The more cultivated intellects may be roughly distinguished into two groups as the scientific or philosophical, and the poetical or artistic; in both an essential factor of their superiority is the prominent part that is played by suggestions based on resemblance. It is by this power that the scientific mind ascends to ever higher generalisations, for a new generalisation is a connection of phenomena by resemblances which had not operated as links of suggestion before. It is by the same power that the poetic imagination embodies the abstract in the concrete, the spiritual in the material. When Newton, according to the familiar story, saw in the fall of an apple a manifestation of the force by which the planets are kept in their orbits round the sun, a resemblance, previously undiscovered, between terrestrial and celestial motions suggested itself to his mind. So when Troilus describes the relation of a lover to the object of his passion as being like that of "earth to the centre," when Cressida more explicitly asserts that—

"The strong base and building of my love
Is as the very centre of the earth,
Drawing all things to it,"*

* Troilus and Cressida, Act iv., Sc. 2.

we have a fine expression of the close approximation between the scientific classification of similar processes and the poetical illustration of the spiritual by the material, of obscure phenomena by those that may be clearly pictured to the imagination.

But it is not in minds of the higher order alone that resemblance is suggestive. It is this that enables the ordinary mind to perform such a common act as the recognition of a portrait by its resemblance to the person portrayed. But, in fact, without this power of suggestion even the simplest acts of intelligence would be impossible. When, for example, in any dish at table, I perceive a peculiar flavour, like that of peach or lemon or strawberry, the perception implies that some previous taste of the same nature is suggested to my mind, and recognised as being identical with the taste at present experienced.

To see that this suggestive force results from the two general laws, it must be observed that resemblance implies, not absolute identity, but merely identity in some feature or features, along with any degree of difference in others. Thus the resemblance, on the ground of which quadrupeds are classed in one group, is founded merely on the one feature of four-footedness, while it admits all such variations, in size and other properties, as, for example, between the elephant and the mouse. Now, the cognition of four-footedness in the elephant, and the cognition of the same attribute in the mouse or any other quadruped, are mental acts identical in their nature, though differing in the time of their occurrence; and they fulfil, therefore, the conditions of the Law of Similarity. But this cognition co-existed, in the one case, with the cognition of the distinctive properties of the elephant, in the other, with the cogni-

tion of the distinctive properties of the mouse or some other quadruped, fulfilling thus the conditions of the Law of Contiguity. We can, therefore, understand why the cognition of four-footedness in one case should suggest, (1) by the Law of Similarity, some previous cognition of the same attribute, (2), by the Law of Contiguity, the associated cognition of the other attributes.

iii.—*Suggestion by Contrast.*

The suggestion of one contrasted object by another has struck all observers. The sketches of the mental life of man in general literature often imply a tendency in present happiness to recall former suffering.

“Forsan et haec olim meminisse juvabit.” *

Present misery seems likewise suggestive of joys that are past :—

“ ——— There is no greater sorrow
Than to be mindful of the happy time
In misery.” †

A very slight attention to the course of private meditations or of social talk will soon disclose numerous instances in which one subject suggests another by way

* *Aeneid*, i., 203. Compare *King Richard ii.*, Act iii., Sc. 4 :—

“—Joy, being altogether wanting,
It doth remember me the more of sorrow.”

† Dante's *Inferno*, v., 121-3 (Longfellow's Translation). Compare Tennyson's *Locksley Hall* :—

“ ——— This is truth the poet sings,
That a sorrow's crown of sorrow is remembering happier things.”

of contrast; so that the thoughts run readily between such opposites as heat and cold, joy and sorrow, greatness and littleness, virtue and vice. It may be added that the advance of culture tends to give increasing power to this principle of suggestion in directing the current of a man's thoughts. For accurate thinking requires, not only that objects be identified with those which they resemble, but often also that they be clearly distinguished from those which are different. Accordingly, the cultivation of scientific habits tends to make objects suggestive of others with which they stand in contrast.

This law of suggestion had, therefore, attracted attention among psychologists, so long ago at least as the time of Aristotle, and it seems, by him as well as by some later writers, to have been considered a special power, incapable of being resolved into any other. Some modern psychologists, indeed, seem to have thought that, in respect of association by the two opposite principles of resemblance and contrast, the world of mind affords a parallel to the world of matter, in which there are the two antagonistic forces of attraction and repulsion. But it is unnecessary to postulate any such independent power, if it can be shown to be merely another resultant of the two laws of Similarity and Contiguity.

To explain this analysis it must be observed that, as resemblance implies some contrast, so contrast implies some resemblance. Two things cannot be contrasted, except in reference to some common feature, in which they exhibit opposite extremes. Giant and dwarf, for example, occupy the extremes of excess and defect in the common property of stature, virtue and vice are the opposite extremes of moral character, heat and cold the opposite extremes of temperature. But there is no contrast between giant and virtue, between vice and cold.

This is the fact which the logicians express in the doctrine, that there is no logical opposition between propositions, unless they have the same subject and the same predicate. Suggestion by contrast is, therefore, capable of explanation in the same way as suggestion by resemblance. The cognition of the common property, on which the contrast is based, in one extreme, and the cognition of it in the other, are mutually suggestive by the Law of Similarity, while the distinctive characteristics of each extreme are suggestible by the law of Contiguity.

iv.—*Suggestion by Relativity.*

The relation of cause and effect is often referred to as forming a bond of connection between our thoughts; but other relations, such as those of parent and child, teacher and pupil, author and production, are also operative in the same way. Yet before a relative can suggest its correlate, the two must have been previously known to be mutually related. Now, to say that the mutual relation of the two must have been previously known, implies that they must have been in our consciousness at the same time, and have thereby fulfilled the conditions of the Law of Contiguity. Accordingly, when any relative term occurs to the mind a second or subsequent time, it may, by the Law of Similarity, recall its previous appearance in consciousness, and this, by the Law of Contiguity, will recall the correlate with which it was associated.

§ 2.—*Secondary Laws of Suggestion.*

There are some phenomena of suggestion which are inexplicable by the primary laws alone, which therefore imply the operation of another set of laws. These

phenomena are connected with the complex character of the mental states which make up the course of our conscious life. For that course is not to be conceived as a thread on which one solitary state of consciousness is strung after another,—as a chain formed of successive links. On the contrary, our conscious life is a complex series of successive clusters of mental states, in which the members of each cluster hold more or less complicated relations with one another, as well as with the members of the immediately contiguous clusters. In this fact there are involved two problems connected with suggestion.

1. Among the mental states which compose the consciousness of each moment, any one may suggest, or several may combine in suggesting, the mental states of the next moment. Now, since all the mental states of the present do not operate equally in suggesting those that immediately follow, the question arises, what is it that makes some of them more suggestive than the rest?

2. But of the states which form the consciousness at any moment each is capable of suggesting, not merely one other state, but usually a number, often a large number, of other states. It is impossible, for example, to enumerate all the thoughts which might be suggested to the mind of an educated Englishman by the thought of Shakespeare. It might suggest any of his dramas, or any of the characters in these, or any of the other Elizabethan dramatists, or any of his editors or commentators, besides a multitude of other subjects. In like manner a vast range of subjects are associated in the minds of educated men with the name of any great author in the world's literature. But all such associated thoughts are never in any case actually suggested: on the contrary, as a rule, only one or a very few ever make their appearance in consciousness. What, then, determines

this selection of the thoughts that are actually suggested among a multitude that are capable of being suggested?

These are the two problems which find their solution in the Secondary Laws of Suggestion. The Primary Laws describe the relations that are required to make one mental state capable of suggesting another. But they do not explain why it is that, when several states are capable of suggesting, and several capable of being suggested, some of them suggest, and some are suggested, more easily than others. The explanation of this is to be sought in the Secondary Laws; and these may therefore be described as the laws which determine the comparative suggestiveness and suggestibility of mental states. They may be brought under three heads, inasmuch as they refer to suggestiveness, or to suggestibility, or to mutual suggestiveness and suggestibility.

i.—*Law of Suggestiveness.*

States of mind are more suggestive in proportion to their intensity and to the number of them that combine in suggesting.

This law consists of two parts. The first expresses the fact that, in the cluster of mental states composing our present consciousness, any one may, by superior intensity, become more powerful to suggest the thoughts of the next moment. The second part of the law implies, that a mental state of the present moment acquires more suggestive power, if its suggestions are aided by other present states. Each of these facts demands explanation.

(A) The first part of the law is of incalculable importance in intellectual life. Without it all study would be impossible. The mental attitude called study is the concentration of consciousness on some object to

the exclusion of others ; but this means the intensification of the thoughts relating to the object of study. Now, what is the purpose of intensifying these thoughts ? It is evidently to make them more suggestive than any of the other mental states which unite with them to make up the entire consciousness of the moment. If any passing sound, or a stray glance, or the unceasing sensations of contact, or any transient emotion, were as powerfully suggestive as the thoughts in which we endeavour to absorb our consciousness, we should always be tormented by that distraction which we fortunately experience only at times, and the difference between consecutive and rambling thought would be abolished.

The prolonged attitude of the mind called study is essentially identical with the briefer act of voluntary recollection. This act, as it involves volition, opens up, in its ultimate issues, the problem in regard to the nature of will ; but this problem need not be discussed at present. Suffice it to recognise the fact, that there is a certain effort of the mind which we understand by volition, however that effort may be explained. When we wish to recall any object, such as a name, which does not suggest itself at once, we make such a voluntary effort. How do we succeed in restoring to consciousness the object sought ?

In reproducing any previous thought we cannot of course violate the laws of suggestion, as in the production of any physical result we cannot violate the laws of external nature. But the productions of art imply the direction of physical laws towards some human purpose ; and so the mental laws of suggestion may be directed by voluntary effort towards some end. We can concentrate our consciousness on any thought which is present ; and thus this thought will be rendered more suggestive in

virtue of the law we are now considering, so that everything associated with it will be more likely to be recalled. There may thus be brought up a whole cluster of thoughts related to that of which we are in search. In this way the second part of the present law may be brought into operation too ; a number of thoughts may simultaneously combine to direct our consciousness to the object wanted. For example, I see a face that I know well, but cannot fix on it a name. I make an effort of recollection. With all my efforts I must still wait till the name is suggested in accordance with the laws of association ; and, therefore, the utmost I can do is to direct the operation of these laws. Accordingly I concentrate my attention on the face, presented or represented. That will recall possibly the place where I saw it before, as well as other associated circumstances, till at last the desired name may turn up.*

It may be added that, as facts locally associated must be made known by sensible impressions, and as these are commonly more vivid than mere abstractions of thought, the superior suggestiveness of local association is partially explained by the law under consideration. This law will be further illustrated in a subsequent chapter by the striking fact of the increased power which memory often acquires in dreams.

(B) In illustrating the first part of this law an instance

* It often happens, in the midst of study, that we strive to remember something in vain. In view of such failure, a useful practical suggestion is given by several writers. If the object sought does not readily recur to the mind, it is better not to waste the mental energy in prolonging a fruitless effort. A prosecution of the collateral study often leads to some link of suggestion, by which the desired object is spontaneously recalled.

has been incidentally noticed, in which the second part is also called into play. A further illustration of this part may be found by observing the difference in the effects produced by different portraits. One portrait is said to be a *striking* likeness, because it strikes or impresses the mind at once by its resemblance to the person portrayed. Another portrait is said to be a *faint* likeness, because it fails to show the same suggestive power. Now, what is the source of the difference in the suggestiveness of the two portraits? In the case of a striking likeness all, or most, of the features in the portrait resemble the corresponding features in the person portrayed; and, consequently, the perceptions of all these features combine in suggesting the person. In the other case there is perhaps but a single feature in which there is any resemblance between the portrait and the original, while even in that feature the resemblance may be imperfect: so that there is possibly but one perception capable of suggesting, and that with some hesitation, the person represented.

The same fact is further illustrated in the history of science. In so far as the progress of science consists in the widening of human generalisation, it may also be said to consist in the discovery of previously undetected resemblances among the phenomena of the universe. Now, all the more obvious resemblances,—the resemblances which touch a considerable number of features,—were discovered in the earliest stages of scientific inquiry; it is the subtler resemblances,—those which connect but a few features, or only one,—that are being revealed in modern times.

ii.—*Law of Suggestibility.*

States of mind are more suggestible in proportion to

- (1) their recentness, (2) their previous intensity, and
(3) the frequency of their previous recurrence.*

The three qualities upon which, in this law, suggestibility depends, require to be separately considered.

(A) *Recentness*. Few facts in the mental life of man are more familiar than the experience that impressions recently received are more readily revived than those received long ago. Every schoolboy knows that the lesson he learnt yesterday may be repeated easily to-day, but that he might tremble if called to repeat it a month hence.

So certain is the law, that it is often applied in medical practice, in the treatment of patients suffering from mental anxiety. Such anxiety commonly arises from the mind being strained to excessive activity by certain thoughts and emotions connected with business or other cares of life; and it becomes of the utmost importance for mental health that these thoughts and emotions should be excluded as much as possible from consciousness. This can be done only by diminishing their suggestibility; and this effect, again, is most likely to be produced by occupying the mind with other subjects of a more suggestible character. Accordingly it is common to recommend a change of scene, so that the patient may receive novel impressions, which, on account of their

* There might be an increased exactness gained by expressing this law in the form:—"Representations are more likely to be suggested in proportion to the recentness, the intensity, and the frequency of recurrence of the mental states of which they are representations." Yet it is scarcely necessary to be reminded that, in suggestion, it is not the prior state itself that is brought into existence again, but merely a representation of it. No serious confusion is likely to arise from speaking, in accordance with ordinary usage, of a former mental state being suggested or recalled.

superior recency, will be suggested more readily, and may ultimately supplant the old causes of anxiety. For this reason travel is generally more effective than residence in one place, since, by repeated change of scene, new scope is continually found for the operation of the law which renders mental impressions more suggestible in proportion to their recentness.

"Haply the seas and countries different,
With variable objects, shall expel
This something settled matter in his heart,
Whereon his brain's still beating puts him thus
From fashion of himself."*

There is an apparent exception to this law, which should not be overlooked. When the memory begins to fail in old age, its failure is observable chiefly in reference to recent impressions, while those of earlier life are recalled with comparative ease. So far as the psychologist has to do with this phenomenon, it must be viewed rather as an illustration of the second part of the Law of Suggestibility than as a violation of the first. In childhood and youth and manhood the mind is undoubtedly more impressible than in old age, and the impressions of those earlier times are accordingly characterised by greater intensity. It is, therefore, natural that they should be suggested more readily than the fainter impressions made upon decaying powers.

(B) *Intensity*. We are now thus brought to consider the effect of this quality upon the suggestibility of mental states. Under the previous law we have seen that the more intensely a mental state absorbs consciousness, it becomes invested with a stronger suggestive power.

* *Hamlet*, Act iii., Scene i.

Many familiar facts may now be adduced to show that the greater intensity of a mental state makes it also more readily suggestible at any subsequent time.

An illustration of this will be found in the effect of an intense emotion, whether joyful or sorrowful, on the current of our thoughts. The unendurable anguish, that attaches to many an intense sorrow, has its source in this law. For everything, that has the remotest association with the sorrow, suggests it readily on account of its superior intensity, so that our consciousness is scarcely ever freed from its presence, "we cannot get it out of our minds." Almost every object around us, being suggestive of our grief, comes to be invested in its gloom: the brighter aspects of nature recall it by contrast, the darker by harmony, and the whole world appears gloomy in consequence. All literature is full of this reaction between the aspects of external nature and the moods of the soul.

Fortunately the same cause imparts an additional zest to our intenser joys. In consequence of their being perpetually re-suggested, "we cannot help thinking of them;" and this perpetual re-suggestion forms what has been felicitously described as an under-current of gladness in the soul. Our joy being readily suggested by almost any object, everything around us comes to be lighted up with its radiance; the whole world seems happy.

"Let no one ask me how it came to pass :
It seems that I am happy, that to me
A brighter emerald twinkles in the grass,
A purer sapphire melts into the sea."*

* Tennyson's *Maud*, xviii., 6.

The love-songs of all literatures represent the dominant passion as being continually re-awakened even by the most trivial associations, while it throws its charm over the whole of nature and of life; and all the other emotions, in their intenser forms, manifest the same power.

In the light of this law we may, therefore, interpret a number of phenomena, which Mr. Mill and other psychologists have endeavoured to summarise in a general statement. "The following," says Mr. Mill,* "is one of the simple laws of mind. Ideas of a pleasurable or painful character form associations more easily and strongly than other ideas, that is, they become associated after fewer repetitions, and the association is more durable. . . . By deduction from this law, many of the more special laws which experience shows to exist among particular mental phenomena may be demonstrated and explained: the ease and rapidity, for instance, with which thoughts connected with our passions or our more cherished interests are excited, and the firm hold which the facts relating to them have on our memory; the vivid recollections we retain of minute circumstances which accompanied any object or event that deeply interested us, and of the times and places in which we have been very happy or very miserable; the horror with which we view the accidental instrument of any occurrence which shocked us, or the locality where it took place, and the pleasure we derive from any memorial of past enjoyment; *all these effects being pro-*

* *System of Logic*, Book iii., Chapter xiii., § 6. See further on the subject Mill's *Dissertations and Discussions*, Vol. i., fourth paper.

portional to the sensibility of the individual mind, and the consequent intensity of the pain or pleasure from which the association originated. Associations being of two sorts, either between synchronous or between successive impressions; and the influence of the law, which renders associations stronger in proportion to the pleasurable or painful character of the impressions, being felt with peculiar force in the synchronous class of associations; in minds of strong organic sensibility synchronous associations will be likely to predominate, producing a tendency to conceive things in pictures and in the concrete, richly clothed in attributes and circumstances, a mental habit which is commonly called Imagination, and is one of the peculiarities of the painter and poet; while persons of more moderate sensibility to pleasure and pain will have a tendency to associate facts chiefly in the order of their succession, and such persons, if they possess mental superiority, will addict themselves to history or science rather than creative art."

The interesting phenomena, referred to in this quotation, all admit of being viewed as results of the more general law, that the superior intensity of a mental impression, without reference to its pleasurable or painful character, renders it more suggestible as well as more suggestive; and this generalisation of the phenomena is, indeed, implied in the words of the passage which I have italicised.

One other remark may be made in this connection. It is suggested, in the above quotation, that an intense sensibility will generally create the poetic or artistic tendency to synchronous rather than successive, that is, local rather than temporal, associations. It thus appears that local associations are based on the comparatively

intense impressions of sense, and that therefore in this fact, coupled (as already observed) with the superior suggestiveness of intensity, we have a partial, if not complete, explanation of the phenomenon noticed in the previous section, that mental states become more easily suggestible when they are linked together by some local association.

(C) *Frequency of recurrence.* This cause of increased suggestibility becomes universally known in our earliest years. When a child is set to learn a lesson, he naturally repeats it over and over again, confident that by this artifice it will be more readily suggested to his mind when he is called to remember it at examination. It is probably this circumstance also that mainly constitutes what is understood by *familiarity*, an object that is described as familiar being thereby classed among those that are frequently recurring to the mind in the home-life of a family.

It is important, however, to observe that this part of the Law of Suggestibility is always conditioned by the previous part. For suppose two boys of equal ability set themselves to learn the same lesson, one repeating it a dozen times inattentively, while the other repeats it but two or three times with intense concentration of mind, the chances are all in favour of the latter remembering it more easily afterwards.

Before passing from this law, an illustration of it may be noticed, which explains a peculiar difference in the memory of different persons. It has often been pointed out, that memory implies both a capacity of retaining knowledge and a faculty of recalling it; and therefore it is not uncommon to find men who, by their retentive capacity, have accumulated vast stores of learning, and are yet gifted with comparatively little readiness in re-

calling it when wanted, though it is more common to meet with those who exhibit great quickness in reproducing comparatively slender acquirements. This familiar distinction between retentive and ready memories is, partially at least, explained by the different conditions of suggestibility ; for, as some psychologists have already observed, retentiveness is cultivated mainly by intense concentration of the mind in the acquisition of knowledge, while readiness is attained rather by frequent repetition of what has been learnt. As the reproduction of what we have already mastered is an easier and pleasanter occupation than the task of mastering what is yet unknown, it is not difficult to understand why memories of comparative readiness should be met with more frequently than those of vast extent. Readiness, moreover, though often combined with extremely limited attainments, yet produces in the popular mind the most striking and intelligible impression of mental power, while, on the other hand, the absence of quickness in recollection may create an appearance of mental slowness—of dullness—in men of great erudition ; and this contrast may account for the popular illusion, which is fortunately contradicted by many conspicuous examples, that great memories are incompatible with great intellects.*

* Sir W. Hamilton, who expresses this distinction by his *Conservative (or Retentive) and Reproductive Faculties*, adduces a number of philosophers, ancient and modern, by whom the distinction has been recognised. See his *Lectures on Metaphysics*, Lect. xxx. ; and compare Stewart's *Elements*, Chap. vi. Both of these passages may be recommended to the student for their abundant illustration, not only of this distinction, but of other interesting facts connected with memory.

iii.—*Law of Mutual Suggestiveness and Suggestibility.*

The drift of this law admits of its being appropriately described also as the *Law of Uniform Association*. It may be expressed as follows —

States of mind are more likely to suggest each other in proportion to the uniformity of their previous association, and in the order in which they have been associated.

It may not be without use to distinguish here between this law and the third part of the previous law. A mental state may frequently recur in consciousness, without being always associated with the same mental state; and this frequent recurrence, even in different associations, will render it more suggestible than at first by any suggestive circumstance. But if its frequent recurrence has been due to its association with the same cause, then the likelihood of its being suggested whenever that cause makes its appearance will be greatly increased, and increased in proportion to the uniformity with which it has been previously associated with that cause. It follows also from this law that, if a mental state A has been associated very frequently with a second B, and only at occasional intervals with a third C, then unless some other law of suggestion intervene, B is more likely than C to be suggested by A.

The full exposition of this law can be found only in later analyses; but here it may be observed that a simple instance of its operation is met with in learning a passage by heart. In this process not only do we repeat the words frequently, but we repeat them in the same connections, so that each preceding word becomes attached in our consciousness to each succeeding word with a certain degree of uniformity. As this uniformity

increases, there grows a stronger tendency in each preceding to suggest each succeeding word. The strength of this tendency is often exhibited by speakers, when they quote a passage, inadvertently dragging in its context, even though it may have no logical connection with the point, to illustrate which the quotation was made. We say that they have become habituated to connect the context with the text; and it will appear by and by, that the strength of habit is due to the power of suggestion arising from the uniform association of the suggesting and suggested states of mind.

It must be observed, however, that the tendency arising from uniform association, manifests its strength merely in the order of the association. A familiar illustration is experienced in the difficulty of repeating backwards the alphabet or any familiar passage in literature, compared with the mechanical ease with which they may be repeated in the right direction.

There is an extreme case of this law which demands special consideration. When an association of mental states has attained the highest degree of uniformity,—has reached, or approached, absolute invariability,—there arises an effect of such a peculiar nature, that it could scarcely have been anticipated from the Law of Uniform Association. The suggestion resulting from such an invariable association becomes irresistible and instantaneous. When, in all our ordinary experience, two states of mind, A and B, have been uniformly associated for a while, A acquires such a power of suggesting B, and B such a power of being suggested by A, that it no longer remains a matter of choice with us whether the suggestion shall take place or not; it becomes irresistible. But it becomes instantaneous as well: there is no appreciable interval between the

suggesting and the suggested states; the latter rushes into consciousness like a flash of immediate intuition, and we fail to observe that it is given merely through the medium of the former, which generally passes unnoticed.

Although this phenomenon is in reality merely an extreme form of the Law of Uniform Association, yet it is at once so striking in its character, and of such significance as affording a clue to many otherwise inexplicable facts, that it is deserving of separate recognition. It may, accordingly, be distinguished, from one point of view, as the *Law of Invariable Association*,* from another point of view, as the *Law of Irresistible and Instantaneous Suggestion*. The drift of this law is indicated in the following expression:—

States of mind, which have long been invariably, or almost invariably, associated, suggest each other irresistibly and instantaneously in the order in which they have been associated.

Numerous illustrations of this law must be noticed afterwards, especially in the analysis of our perceptions. These cognitions generally appear like direct presentations of an external object to consciousness, whereas psychological analysis discloses the fact that they are merely suggestions which have become instantaneous from long association. Our perceptions belong to a class of phenomena which may appropriately be noticed here by way of illustrating the effects of irresistible and instantaneous suggestion. They are the phenomena styled *habits*. A habit is a tendency in certain actions to recur, which is acquired by repeated occurrence.

* Some writers have employed the less unexceptionable term, *Inseparable Association*.

It differs, in the fact of its being acquired, from an *instinct*, which is a tendency of the same sort, born with the individual. Habit, therefore, presents a problem for the psychologist in the fact, that a tendency to perform certain actions is created by repeating them frequently before. When we begin to acquire a habit or dexterity, we perform deliberately, slowly, and in general with difficulty, the actions which it implies; but gradually by frequent repetition,—by practice, as it is commonly expressed,—the difficulty, slowness, and deliberation, with which the actions were done at first, give way to ease, rapidity, and unconsciousness. The actions are then described at times as being done *instinctively*, from their resemblance to the results which nature produces in us without any conscious volition on our part; while their resemblance to the regular, easy, unintelligent workings of a machine leads us to speak of them also as being done *mechanically*. In learning to read, for example, the child at first familiarises himself slowly with the sound of every letter, slowly acquires the power of recognising the sounds of different combinations, of spelling syllable by syllable, and word by word, till he is able to recognise at a glance entire words without the previous painful labour of spelling each letter, entire clauses and sentences without dwelling upon each word, and even to catch the meaning of whole pages when they are merely run over in a hurried glance. The same process is observed in learning to walk, to speak, to sing, to play on a musical instrument, to direct pencil or chisel or sword, and generally in acquiring all those arts that are necessary for existence or for the enjoyment of life.

The peculiar problem of these phenomena is solved mainly by the law of Irresistible and Instantaneous

Suggestion. Of course in the acquisition of a habit that is interesting the mind will naturally be occupied with some degree of intensity, while the mere repetition of an action tends to make it more easily suggested, whether it has entered into any uniform association with others or not. But the tendency in a series of phenomena to recur, which constitutes a habit, is created by the general fact, that one phenomenon tends to be suggested by another more readily in proportion to the uniformity with which the former has already been suggested in association with the latter. Take, by way of illustration, the learning of a language, native or foreign. In learning to *understand* the language, we associate sounds with ideas, so that after a while the latter come to be suggested irresistibly and instantaneously by the former. On the other hand, in learning to *speak* the language it is necessary, first of all, to associate ideas with articulate sounds, so that the former will suggest the latter; but the suggested sounds must further be associated with the remembered sensations of the muscular effort in the vocal organs, by which the sounds are produced.

We are thus in a position to explain the peculiar circumstance connected with our habits, that we become capable of performing a series of actions without being conscious of the individual actions in the series, but merely of the series as a whole. When a habit is confirmed, when any dexterity is perfectly mastered, each antecedent in the series of actions involved becomes so indissolubly associated with each consequent, as to suggest it irresistibly and instantaneously. Now, to excite consciousness any stimulus must fulfil certain conditions. It must not only reach a certain intensity, but it must endure for a certain length of time. The duration necessary to excite consciousness varies evi-

dently for different organs in the same person, for the same organ in different persons, and even for the same organ in the same person at different times. In taste and smell sensations are very soon confounded, even when they do not follow each other in very rapid succession. The higher senses themselves, though their sensations are much more quickly distinguishable, are subject to the same condition. In hearing, as we have already seen,* when vibrations reach a greater rapidity than about forty in a second, they become fused into one tone. Even in the most intellectual of the senses a rapid series of impressions results in a similar fusion. Thus the appearance of a circle of light may be produced by whirling a lighted point with sufficient velocity before the eyes; the sensation of white light may be excited by a similar movement of the colours of the spectrum, into which it is decomposed; while many striking optical effects of the same sort are now familiar in the thaumatrope, the wheel of life, and other interesting scientific toys.

In all such fusion of different impressions the same cause may be traced. Before each prior impression has died away, or even before each prior stimulus has had time to excite distinct consciousness, the next supervenes. The resultant consciousness is, therefore, the consciousness, not of any single impression in the series, but of them all blended together. Now, this is precisely the phenomenon that is witnessed when a series of actions are performed with the velocity characteristic of habits and dexterities. The indistinguishability of the individual actions,—their fusion in a general consciousness of the series as a whole,—is a result of the rapidity, the instan-

* Book i., Part i., Chapter ii., § 4.

taneousness, with which suggestion takes place when it is based on a prolonged association of an uniform kind.

It thus appears that actions, originally voluntary, may, by frequent repetition for a length of time, be removed from the sphere of human will into the sphere of those natural forces that form the human constitution. From the physiological point of view these phenomena are described as actions of the nervous system which work out their results in human life without exciting consciousness. It is a problem for the physiologist to explain how nerve-tissues, which at first adapt themselves only with difficulty to certain movements, become so pliable after repeated practice of the movements, that these are performed with mechanical ease. Probably the nutrition of the tissues is so directed that their structure becomes modified in adaptation to the repeated movements. It is in fact obvious, even to one simply observing his own sensations, that, when certain currents of the blood and currents of nerve-force have been prolonged for a while by the repetition of a series of movements, they often continue their course for hours after the movements have ceased. But, whatever explanation physiology may give, there can be no doubt of the fact, that actions in the nervous and muscular systems, which at first are performed with deliberate and even painfully conscious efforts of volition, come to be carried on automatically after a while. This phenomenon is accordingly described as automatic or reflex action; and as even some of the higher mental operations may be thus, by habitual exercise, withdrawn from the region of conscious effort into the control of the highest nerve-centres in the brain, it has become customary, of recent years, to recognise a process of "unconscious cerebration."

It is in the phenomena thus brought under the general Law of Irresistible and Instantaneous Suggestion, that the great moral and religious teachers of the world have found the inevitable fact of retribution which rules with an unfailing justice all the actions of men, a fact which has often been expressed by the singularly appropriate figure, implied in the statement, that "whatsoever a man soweth, that shall he also reap."

CHAPTER II.

COMPARISON.

IN our consciousness mental states appear, not in absolute isolation from each other, but in manifold relations; and mental life consists, not in the consciousness of isolated states, but in the consciousness of the relations which they hold one to another. The consciousness of relations is always, in its essential nature, an act of comparison; the related phenomena must be compared in order to the discovery of their relations. The term *comparison* may not fully express all that is involved in the mental act under consideration; but it implicitly denotes all that is understood, inasmuch as there cannot be a comparison without a consciousness of some relation between the objects compared. There are some features of resemblance between comparison and suggestion; but a confusion of the two would lead to a very radical misapprehension regarding mental phenomena. It is desirable, therefore, to make clear the distinction between the two processes,

The two resemble one another in the fact that both require two mental states in order to their possibility. Suggestion always implies a suggesting and a suggested state of mind, while comparison supposes two things to be compared. There is a further resemblance in the fact that both acts imply a relation between the two

states which they presuppose. In connection with the Primary Laws of Suggestion, it was shown that two mental states must be related by similarity or contiguity before they can suggest each other ; and it is still more obvious that, in being compared, they are brought into relation.

But there are two important differences which distinguish comparison and suggestion. The first is, that suggestion implies a sequence,—a transition from the suggesting to the suggested state ; while, in order to the very possibility of comparison, the phenomena compared must be simultaneously present to consciousness. Besides, there is a second and more radical difference—it is the essential difference—between the two acts. In suggestion we are conscious of the one related state, then of the other, the relation forming merely an unconscious bond of connection between them ; whereas the distinctive nature of comparison consists in its being a consciousness of the relation between the related states.

Comparison may thus be defined a *knowledge of relations*. As such it is the highest function of mind ; it implies not only the capacity of receiving impressions, and of allowing these unreflectingly to repeat themselves in the order and connexions determined by their accidental associations in consciousness ; it implies further the faculty of cognising, beyond the separate impressions, the relation in which they stand to each other. This is the faculty which is understood by the various expressions descriptive of mind in its highest aspects,—Thought, Understanding, Judgment, Intellect, Reason.

To the full explanation of comparison, it would be necessary to unfold all the relations which it is capable

of discovering. It is impossible, however, to describe these at present without entering upon problems, which must be reserved for subsequent discussion. But, without anticipating this discussion, it may be observed that there are two fundamental relations, which, if not the type of all others, form at least the basis of all knowledge. These are the relations of Identity and Difference. The consciousness of the former is technically called an Affirmative Judgment; that of the latter, a Negative Judgment. It will soon be seen that these judgments enter into all our knowledge.

Such acts of judgment or comparison, in which phenomena are identified and discriminated, are governed by laws. These laws, in their supreme form, are three, which are accordingly named the General Laws of Thought. Though it may seem paradoxical to say so, the chief difficulty which is experienced in understanding the purport of these laws arises probably from their excessive simplicity. They are such obvious truisms, that there seems almost an insult to intelligence in their mere statement; and, accordingly, there is a temptation to seek some more profound meaning in them than that which they show on their surface. But the laws, which form the elementary principles of all thinking, must be so utterly evident, that nothing more evident can be conceived,—so absolutely certain, that nothing more certain can be adduced either for their proof or for their disproof.

The following, then, are the General Laws of Thought :—

I. The *Law of Identity* is popularly expressed in the formula, *Whatever is, is*; more technically in the formula, *A is A*. Its purport, as a law of thought will probably be better understood by the following state-

ment :—*Whatever is thought must be thought to be that which it is thought.*

II. The *Law of Contradiction*, as it is commonly called, or the *Law of Non-Contradiction*, as it has been, perhaps more appropriately, called, is expressed in the popular formula, *It is impossible for a thing to be and not to be at the same time*, sometimes in the technical formula, *A is not non-A*. The purport of the law may be more clearly indicated by the statement :—*Whatever is thought cannot be thought not to be that which it is thought.*

III. The *Law of Excluded Middle* is so called, because by it a middle or third alternative is excluded between two contradictory judgments, inasmuch as one of these must always be in thought affirmed, the other in thought denied. This law is not, like the other two, known by any familiar statement. Its technical expression is the formula, *A either is or is not B*; but perhaps the following formula may explain it more distinctly :—*Of whatever is thought anything else that is thinkable must either be or not be thought.*

The science, which expounds these laws in all their subordinate applications, is Logic. The function of Logic is, therefore, to discover the norm, by which thought should be regulated. It is not, however, with normal, but with actual, thinking, that psychology has to do; and we shall find, as we proceed, that the problems of the two sciences have sometimes been unnecessarily complicated by not being kept distinct.

that

only
een,
the
not
ical
may
ever
it is

use
een
ese
ght
by
the
ow-
ver
or

air
of
ch
th
to
ns
ly

BOOK II.

SPECIAL PSYCHOLOGY.

IN the previous Book we have examined those elementary products of natural sensibility which have been called the raw materials of mind, as well as the processes by which these are wrought into the combinations which form the actual mental life. Our task is now to investigate the distinctive nature of the different combinations which are thus formed in the living consciousness of men. These combinations assume three fundamental types, which are usually distinguished by the names of Cognition, Feeling, and Volition. Those different types of mental life arise from the development of three different aspects which elementary sensations present. For these may be viewed as sources either of (1) information, or (2) of pleasurable and painful excitement, or (3) of impulse to action. In so far as the first aspect of sensation is developed in any mental combination, the resultant consciousness is a cognition; the development of the second aspect gives rise to feeling or emotion, while volition is evolved from the third. These three aspects of sensation may, therefore, be described as the intellectual or cognitional, the emotional, and the volitional.*

* Though the germ of this threefold classification is by some writers traced as far back as the *Timaeus* of Plato, yet it seems to

The evolution, therefore, of those mental combinations which form the intellect, the emotions, and the will of man, is determined by the readiness with which sensations submit to the two processes of association and comparison. Now, association involves both a suggesting and a suggested state of mind; and, accordingly, the associability of a sensation must be interpreted by reference both to its suggestiveness and its suggestibility. Comparison, also, involves both identification and discrimination, so that the comparability of sensations is to be estimated by their power of being at once identified and distinguished. It may be added that comparability holds in representation as well as in presentation. The distinct representability of a sensation, therefore, expresses the clearness with which it may be distinguished and identified when it is merely represented in memory or imagination. Consequently, distinct representability is not to be confounded with ready suggestibility; for a sensation may be readily recalled as an indefinite fact of mental life, even when its nature cannot be vividly represented in consciousness.*

have taken definite form first among the writers of the Leibnition-Wolfian School about the middle of last century, especially Meier, Moses Mendelssohn, and Tetens (Erdmann's *Geschichte der Philosophie*, § 301, 2). As Kant was brought up in this school and adopted the classification, it has passed through his writings into the philosophical literature of all Europe. See an historical and critical discussion of the subject in Wundt's *Physiologische Psychologie*, Vol. i., pp. 11-18 (2nd ed.) See also Hamilton's *Lectures on Metaphysics*, Lect. xi., and Lotze's *Mikrokosmos*, Book ii., chap. 2.

* The distinction here indicated is expressed by Sir William Hamilton in the discrimination of the Representative from the Reproductive Faculty. See his *Lectures on Metaphysics* (xxxi.-xxxiii.), where interesting illustrations of the distinction will be found.

It will be seen, then, that we are thus furnished with a criterion to determine the order in which the senses take rank as contributing more or less important materials for the upbuilding of mind in all its three functions. Their relative value for this purpose depends on the associability and comparability of their sensations. The examination of the different senses in detail with the view of determining their relative value in this respect is part of the problem which forms the subject of the present Book ; but one or two general remarks on the subject may be made at present.

1. The two properties of associability and comparability evidently coincide in general, those sensations, which can be most clearly discriminated and identified, being the most powerfully suggestive and the most readily suggestible. Accordingly the mental value of sensations may sometimes, with sufficient accuracy, be estimated by *distinct representability*. For as representation is impossible without suggestion, and as the distinct representation of anything implies that it can be clearly discriminated and identified, the distinct representability of a sensation may be taken as a convenient, though not a complete, expression of its associability and comparability. These two qualities, moreover, enable us to interpret the language which ascribes a superior *refinement*, intellectual or moral, to some sensations over others. For the association and comparison of a sensation with others imply that the consciousness is raised above the gross act of sense, and occupied with an act of thought—a relation. This power of rising above the mere animal sensibility is what constitutes refinement.

2. The associability and comparability of a sensation depend on the nature of the other sensations with which

it is associated and compared. (*a*). Take associability first. A sensation with low powers of association will associate more readily with other sensations which are of strong associability. Thus a taste, which is of comparatively slight mental value, is neither very suggestive of other tastes nor very readily suggested by them, but it becomes at once more suggestive and suggestible, if it is associated with a higher sensation, such as a colour. (*b*). The same fact may be noticed in the relative comparability of different sensations. The sensations, which do not admit of distinct comparison with one another, are easily compared with any class of sensations that are in themselves more comparable.

These remarks will receive illustration as we proceed in our analysis of the three forms of mental activity. For convenience in exposition ~~we shall~~ we shall divide this Book into three Parts.

PART I.

COGNITIONS.

THOUGH the more technical term, *Cognition*, has come into general use for the class of phenomena investigated in this Part, yet we shall frequently recur to the familiar word, *knowledge*, using, where necessary, the plural, *knowledges*, which, though commonly abandoned in modern English, was employed by older writers. As cognate with the substantive, cognition, it may often be convenient to use the verb, *cognise*, and the adjective, *cognitive*.

In classifying the phenomena of cognition, the most natural principle of guidance would be to follow the natural evolution of human intelligence. The course of such an evolution is not so easily traced as in the case of many among the simpler and more palpable phenomena of external nature; for, as the subsequent analysis will show, the principal forms of intelligence are, to a certain extent, developed simultaneously. At the same time it is not impossible to discover the order in which the most distinctly marked varieties of cognition tend to reach a certain degree of maturity. Naturally the developing intelligence apprehends first of all the individual sensible

object. This is the cognition to which the name of Perception is now commonly applied. The next stage is the conception of a class,—the intellectual activity described by such terms as Generalization. Running alongside of these cognitions, but later in its distinct evolution, is the process of Reasoning, by which thought ascends from the individual to the class, or descends from the class to the individual, with a consciousness of the reason for its ascent or descent. Lastly, there is an activity of intelligence which apprehends the universal in the particular,—the general attributes of the class in individual form; and this may, with sufficient accuracy at present, be described as Idealisation. Besides these normal functions of intelligence, it will be advisable to examine some of those familiar illusions which simulate the appearance of cognition. Each of these subjects demands a separate chapter for satisfactory discussion; and we shall then proceed, in a concluding chapter, to summarise the results, to which the discussion of these subjects points, in regard to the general nature of knowledge.

CHAPTER I.

PERCEPTION.

THE word Perception, like its Latin original, was, in earlier philosophical writings, and is still, in common speech, employed in a somewhat looser sense for any kind of knowledge, at least, if it is apparently immediate, that is, if it does not seem to imply any very lengthy process for its attainment. In more recent times, however, it has come to be limited, in English philosophical literature, to the knowledge of an individual sensible object, this limitation having probably been brought about mainly by the influence of the Scottish School.*

The perception of an object, especially through the sense of sight, seems, to the ordinary consciousness, the most simple of cognitions,—the direct presentation of an object to the mind through the channels of sense. This cognition has, therefore, long withstood the efforts of psychological analysis; and an appeal against such efforts has been repeatedly made, even in recent philosophy, to the common sense, to the universal and

* An interesting note by Sir William Hamilton on the history of this word will be found in his edition of *Keid's Works*, p. 876.

inesistible convictions of men * It will appear, however, on examination, that even the simplest act of perception implies both association and comparison, and therefore a combination of elements which are associated and compared.

To make this evident, let us take a very simple perception by way of a general illustration. The perception of the taste of an apple furnishes a good example. To an unscientific mind the perception will appear simply as the immediate cognition of an object revealed through the sense of taste. But the moment scientific analysis sets to work on the perception, it discloses a much more complicated composition. For it becomes at once evident that the sense of taste, by itself, is altogether incompetent to give even such a simple cognition, or indeed any other cognition whatever. Isolate the sense of taste from other sources of information, in order to find what it contributes to our knowledge ; and what is the result ? What are we conscious of in tasting ? Merely of the sensation,—the mental phenomenon,—that we call a taste. But to understand the full purport of this, observe what it implies ; and what we *are* conscious of may perhaps be most fully brought to view by pointing out what we are *not* conscious of in tasting.

1. We are not conscious, by taste alone, of any sapid property in a body,—of any property by reason of which it is capable of exciting a sensation of taste. It is necessary to bear this constantly in mind on account of the ambiguity in the word *taste*. Like the names of other sensations, such as smell, colour, sound, and heat,

* See the *Dissertation on the Philosophy of Common Sense*, by Sir W. Hamilton, appended to his edition of *Reid's Works*.

taste is used both for a sensation and for the external cause by which the sensation is produced. Now, we are immediately conscious of the sensation which we call a taste; but what that is in a body, which excites the sensation, could never be discovered by any use of the sense of taste alone,—can be discovered only by those researches of the chemist, which call into play various other senses and faculties of intelligence.

2. We are not conscious, by taste alone, of any body at all. A body is a thing that occupies space, and resists our efforts to displace it from the space occupied; but it need scarcely be said that neither space nor resistance can be tasted.

3. It follows from this that taste of itself gives us information, not even of our own body, nor—it is almost needless to add—of any organ in our body, through which we afterwards learn that the sensations of taste are received.

If, then, in the mere act of tasting, our consciousness is limited to the sensation excited, it may be asked, how do we come to *know*,—to perceive anything by the sense of taste at all? To answer this question, we must understand all that a sensation involves. Now, it is true that, in its abstract indeterminateness, a sensation may be described as a purely subjective condition of mind. But as a concrete fact of mental life, it is a fact of which we must be conscious, and to say that we are conscious of it is merely another way of saying that it is an object known. The consciousness of a sensation may, indeed, take a variety of forms. The sensation may be such, that its pleasurable or painful character becomes predominant; and then the consciousness appears as mere feeling. But the pleasure or pain felt may act as a stimulus to the will, and then a conscious volition is the

result. If, however, the pleasure or pain excited by a sensation is subordinate to the information communicated, the consciousness has risen to a cognitive act. It will, therefore, appear by and by, that sensations of absorbing intensity, however important in view of the contributions they make to the pleasures and pains of human life, are comparatively valueless for the purposes of human knowledge; while nearly all our information about the world in which we live is based on sensations which, if not absolutely neutral in quality, are at least so faintly pleasurable or painful, that the consciousness, instead of being absorbed in our subjective condition, may contemplate that condition with the same calm disinterestedness as if it were an objective fact.

The truth is that, in being conscious of a sensation, it becomes to us, not merely a *subjective* state, but an *object* of knowledge. This objectification of sensations implies, of course, that we distinguish an object known from ourselves who know it. How those antithetical ideas of self and notself are originally formed, is a problem that must be reserved for subsequent discussion. At the present stage it need only be observed that, in some way or other, this distinction is rendered possible. Now, it is this distinction that constitutes the first step in the evolution of knowledge; for I cannot be said to know until I am conscious of something that is not I, that is known by me. But whenever anything becomes to me an object, it may be brought into those combinations and comparisons which constitute all our cognitions in their various degrees of complexity. To these combinations and comparisons we now proceed; but it should be observed that, even at this stage, an act of comparison has been performed; for the discrimination of self and notself is a consciousness of difference.

Proceeding in the analysis of the simple perception with which we set out,—the perception of the taste of an apple,—we immediately detect further acts of comparison involved. To know this sensation as the taste of an apple, implies both a cognition of difference and a cognition of identity,—in fact, a twofold cognition of each. For, in the first place, I cannot know the sensation to be a taste, without distinguishing it from other sensations which are not tastes; nor, still further, can I know it to be the taste of an apple, without distinguishing it from tastes which are produced by other substances. We may leave out of consideration the case in which my perception may be more specially discriminative by my knowledge of the difference between the tastes of varieties of apples. But, in the second place, I cannot know this sensation to be a taste, except by identifying it with similar sensations experienced before, and known to be tastes; while the more definite perception of the taste as being the taste of an apple implies that I have identified it with previous tastes which I knew to be produced by that fruit.

But what is implied in these acts of comparison? It is evidently impossible to compare a present sensation with sensations of the past, by way either of discriminating or of identifying, unless these sensations are reproduced in my present consciousness by suggestion. This, however, is not the only activity of suggestion in the formation of the perception. For when I perceive a taste to be the taste of an apple, I associate the taste with those general appearances which an apple presents. But these appearances are somewhat complex. They contain ideas of a spherical shape as well as of comparative smoothness and hardness, received from touch and the muscular sense; they involve also visual ideas,—ideas of

colour, red, green, or russet, according to the variety of apple that most readily recurs to the mind. This complex association of muscular, tactile, and visual ideas, is therefore also suggested in the perception of the taste of an apple. The perception involves some additional elements of a more difficult nature ; but these need not be discussed here.

It is scarcely possible to hit upon a perception more simple in appearance than that which has been selected for illustration ; yet even this perception is seen to involve considerable complexity. It is true that this complexity is brought to light only by such an analysis as that which we have gone through ; and consequently the young observer finds it difficult, in spite of the analysis, to admit such complexity in an act which seems so simple. To remove this difficulty he must remember that such perceptions were not always so simple as they are now. The perceptions, which appear absolutely simple to the intelligence of maturity, are evidently, in childhood, the result of tentative, hesitating intellectual efforts, such as we are conscious of in later years, when we seek to become acquainted with a novel set of phenomena,—to master a new language or a new science. Moreover, the secondary laws of suggestion show that mental acts come to reproduce themselves more readily by repetition, especially in uniform associations, till they may become absolutely instantaneous ; and it is in virtue of this, that the tentative hesitancy of infantile observations disappears with the growth of disciplined intelligence.

After this exposition of the general process by which perceptions are formed, we proceed to the examination of the special perceptions which we owe to the several senses. Here, again, the exposition should most appropriately follow the natural evolution of intelligence, if

that evolution could be traced with certainty. On such a principle we should begin with the vaguest forms of general sensibility, and follow our perceptions as they were gradually developed in connection with the most distinctly differentiated forms of special sensibility. But conscious perceptions presuppose special senses already developed; and consequently there is a convenience in beginning the exposition with these. There is a further convenience in taking first those senses which are of low intellectual power, inasmuch as their perceptions are necessarily of a much less complicated character than those which are based on sensations that readily admit of numerous associations and comparisons. We shall, therefore, adopt again the order previously followed in describing the senses.

§ 1.—*Perceptions of Taste.*

In man generally, as contrasted with the brute, and in civilised man especially, as contrasted with the savage, even the sense of taste, though lowest of all the special senses in intellectual rank, scarcely ever remains at the stage of mere sensation. The lower animal, in feeding, seems absorbed in the mere organic pleasure which he is receiving; and from the accounts of travellers and missionaries, who have become familiar with savage life, it appears as if the meal of the lowest savages approached, in a disgusting degree, the character of purely animal gratification. But the tendency of civilisation is to lift man out of mere sensuousness in the enjoyments of taste. In civilised communities, therefore, even the gourmand derives his gratification largely from appreciating, often with a high degree of nicety, the delicate

peculiarities of the viands and beverages in which he indulges; while the gastronomy of a luxurious life is based on a certain amount of scientific art in the culinary preparation of food, as well as in the order in which dishes and wines are served so as to give the largest play to the discriminative sensibility of taste.

It may be interesting to add here, that the same tendency of civilisation in regard to the pleasures of the table is exhibited in a variety of other ways. It appears in many, if not all, of the customs which regulate meals ever more prominently with the progress of wealth and culture. The ancient Pagan custom of making sacrifices or libations to the gods, and the Christian custom of saying grace, at meals; the formal ceremony, which imparts a certain degree of human dignity to the proceedings; the music, and the decorations of room and table, by which the higher senses are gratified; the more purely intellectual enjoyment of conversation,—the “Attic salt” with which the meal of educated men is spiced;—all these indicate the tendency of civilised man to raise the act of eating above the character of a merely animal act. In fact, from the artistic setting in which even the grossest meats may be served, it would almost seem as if mere gustatory sensation were to become a vanishing fraction of the enjoyments of the table.

All men learn to discriminate the more marked differences of taste, especially in articles of food, and can thereby often detect the presence of substances which are not readily perceptible by other senses. But if the attention is specially directed to the minuter differences of taste, a delicacy of perception may be reached which is sometimes of service, not only to the gourmand in the pursuit of pleasure, but in the serious business of life to

the chemist, the wine merchant, the oil merchant, and others.* It has been observed that, when a more distinct perception is desired, the sensibility of the tongue is increased by passing sapid bodies over its surface—one of the numerous instances in which muscular activity comes to the aid of passive sensibility.

The intellectual element, involved in the perceptions of taste, explains the common figure of speech, by which the words, expressing these perceptions in various languages, are transferred to cognitions which have no connection with sense. Thus the word *taste* in our own language, and its equivalent in others, is used for the faculty by which we appreciate the beautiful and the sublime. The Greek term for *wisdom*, σοφία, as we see from its Latin kindred *sapientia*, literally means *taste*; while, in several passages in which the English version represents exactly the original, the Scriptures describe by this expression the purest acts of man's spirit.†

* "I knew a person who possessed the one (the sense of taste) in so great a perfection, that, after having tasted ten different kinds of tea, he would distinguish, without seeing the colour of it, the particular sort which was offered him; and not only so, but any two sorts of them that were mixed in equal proportions; nay, he has carried the experiment so far, as, upon tasting the composition of three different sorts, to name the parcels from whence the three several ingredients were taken." (Addison in *Spectator*, No. 409). Brillat-Savarin reminds us of Roman epicures who professed to know from the taste of a fish, whether it had been caught above or below bridge, and of those in modern times who could tell by taste alone on which leg a partridge had slept (*Physiologie du Goût*, Anderson's Translation, pp. 25-26). It would be satisfactory to have some statements like these verified by proper scientific observations.

† "Taste and see that the Lord is good" (Psalm xxxiv. 8); "Tasted of the heavenly gift, . . . tasted the good word of God" (Heb. vi. 4-5).

But, after all, the intellectual capabilities of taste are slight, when contrasted with those of the other special senses; that is to say, its sensations are not readily associable or comparable.

I. The *associability* of tastes with tastes is, indeed, implied in every identification—recognition—of a taste; but this is association of that simple sort which is involved in the very possibility of knowledge. It is merely the revival of a previous sensation through suggestion by a present sensation which is identical with it in nature; in other words, it is suggestion by the Law of Similarity. But the association of tastes by the Law of Contiguity is probably very slight. We seldom, if ever, have an instance of one taste suggesting another merely on the ground of their having been in consciousness at the same time. The association of a taste, however, with ideas of a more intellectual sense like sight is more marked. Thus a taste will readily recall the visual appearance of a sapid body; but this illustrates the associability, not of tastes, but of sights. This, too, is the only form in which ideas of space associate with tastes. Abstract space—position or distance—is incapable of being perceived through the medium of this sense.

II. Tastes do not admit of *comparison* with ease. It is true, that the analysis of a simple perception in the introductory part of this chapter has proved that every recognition of a taste implies its power of being identified and discriminated. But this power, whether in the presentation or in the representation of tastes, is extremely limited.

1. In presentation simultaneous tastes can scarcely be distinguished at all; and even a succession of tastes, though not very rapid, soon confounds the sense. It is by this means, in fact, that we all learn from childhood

to neutralise a nauseous taste by saturating the mouth with a sweet substance beforehand, and thus destroying for a time its sensibility to any other. In this respect a very marked contrast is furnished by the sensations of touch, hearing, and sight, which become indistinguishable only in very rapid succession.

2. But neither can tastes be represented with distinctness. In the representation of beautiful sights or tones, or of tender touches, a delight is often felt similar to that furnished by the original sensations; but no such pleasure is ever experienced in the representation of tastes.

"O who
Can cloy the hungry edge of appetite
By bare imagination of a feast?"

The result is that the common furniture of ideas, with which the human mind is stocked, is derived only to a very slight extent from the sense of taste. In illustration of this it has been asserted by Longuet, that in dreaming of a feast we never dream of tasting, but merely of seeing the viands.* Inquiry, it is true, proves that this assertion is too sweeping, though it accords with my personal experience. Still it is certain that tastes occupy an insignificant place among the pictures that make up the consciousness of dreams or of waking life; and consequently imagination is seldom sent wandering among the mental stores of a revivable past by any impulse which it receives from memories of taste.

It is not, therefore, difficult to explain why the perceptions of taste provide but a slender portion of the imag-

* Of all persons in the world who should confirm Longuet's assertion but M. Brillat-Savarin! See his *Physiologie du Goût* (Anderson's translation, p. 153).

ery which forms the materials of poetic art. The descriptions of banquets, in which poetry indulges at times, give an almost exclusive prominence to those aspects of the occasion, which have been already noticed as prevailing ever more and more at the meals of civilised men. It is the glory of the festal pomp, the visual gratification in artistic groupings of colour and form, the rank or beauty of the guests, the light play of intellect, and the gush of social feeling,—

“The feast of reason and the flow of soul;”

such are the factors of the banquet which the poet selects as alone suitable for his purpose. If the meats and drinks are introduced into the description, except perhaps in the poetry of a coarser age, their gustatory effect is ignored, they are noticed only in their picturesque aspect as forming parts of a beautiful scene.* Perhaps an approach to æsthetic enjoyment in gustatory gratification is experienced in the order of tastes prescribed by a skilful gastronomy,—

“What order so contrived as not to mix
Tastes not well-joined inelegant, but bring
Taste after taste upheld with kindest change.”

This may give to tastes a place in the poetry of a ruder

* In illustration of this Mr. Grant Allen has cited three well known descriptions from Milton, Keats, and Tennyson (*Physiological Æsthetics*, pp. 260-1). Similar passages, some briefer, some more elaborate, might be adduced both from ancient and from modern literature. It is remarkable that even a humorous description, with so much mere animal gusto as Burns' verses *To a Haggis*, should not once mention the taste of the dish it celebrates, but collect its imagery exclusively from the visual appearance of the dish, and its remoter suggestions.

people ; but, strictly speaking, the æsthetic consciousness is at zero in the perceptions of this sense.

§ 2.—*Perceptions of Smell.*

It has been already mentioned, that the organ of smell, especially its intracranial portion, is more largely developed in many of the lower animals than in man. As a result of this, among these animals the sense of smell is of much higher value as a means of obtaining information about the external world, though it is little, if at all, used as a source of feeling. To a dog on the scent, the pleasantness or unpleasantness of odours seems insignificant ; he examines with almost equal keenness a loathsome putrefaction and a fragrant perfume. But he learns more of objects generally from their smell than the careless observer might at first suppose. You may often catch a dog gazing at a person with the vacant look of ignorance or doubt, even when he is near enough to see distinctly ; but his recognition is decided at once by a whiff of odour. In fact, a psychology of animals with a keen scent would, perhaps with truth, describe their world as one in which odours take the prominent place that sights occupy in ours.*

A somewhat similar fact is observable in the function that smell performs among the lower races of men. The savage applies his scent to obtain a great deal of information, for which the civilised man has recourse to the higher senses of hearing and sight. Haller states that

* The significance of this is only beginning to be recognised in Comparative Psychology. See an interesting article by Mr. Grant Allen, on "Sight and Smell in Vertebrates," in *Mind* for October, 1881.

the negroes of the Antilles can distinguish by smell the footstep of a negro from that of a Frenchman; and, according to Humboldt, the same sense enables the Peruvian Indians to tell, when a stranger is approaching, whether he is an Indian, an European, or a negro. In civilised communities, also, it is a remarkable fact, that persons of a low mental type exhibit the same characteristic. Idiots are often observed examining other persons by their odour; * and it is a curious fact, that a keen scent for human flesh is commonly ascribed to the giants of folk-lore, who are probably the survivals in popular tradition of those types of uncultured brute force, belonging to an earlier civilisation, with which the higher races must have come into conflict in prehistoric times. But the tendency of civilisation is to disuse the sense of smell as a means of perception, and to resort to it merely for its delicate gratifications. † This is significantly indicated in the fact, that language has no names for distinct kinds of smell, like the terms by which colours and sounds, and even tastes, are distinguished. Odours are designated simply by their agreeable or disagreeable quality, as perfumes or stench.

* Maudsley's *Physiology of the Mind*, p. 215.

† Certain differences in the organ of smell among civilised men and savages are obvious. Even the external shape—the extraordinary breadth—of the nose in some of the lower races seems to point to a larger expansion of the nasal membrane. But negroes often exhibit an additional peculiarity. In men generally the interior of the nostrils is convoluted into three meatuses by the three turbinated bones. In the negro there is often found a fourth meatus above the superior turbinated bone, implying a considerable increase of sensitive surface. I cannot find, however, that observations have discovered any corresponding enlargement of the olfactory bulb.

But even in civilized life smell sometimes acquires extraordinary acuteness when there is any cause to stimulate its unusual development. The requisite stimulus may be derived from professional requirements, as when the chemist accustoms himself to detect by their odour the presence of certain substances in compounds. The peculiar education, to which Caspar Hauser's mysterious history had subjected him, accounts, in some measure, for the extraordinary acuteness of scent which he possessed. Among other facts it is related of him that, at some distance, he could distinguish apple, pear, and other fruit trees by the smell of their leaves. The most astonishing examples, however, of acuteness in the perception of odours are, in civilised life, to be found among those whose loss of an important sense like sight has obliged them to seek compensation in the increased refinement of the others. Thus the blind deaf-mute, James Mitchell, is said to have possessed, besides a remarkable keenness of scent in general, the peculiar faculty of discovering by smell, not only the presence of a stranger in a room, but also the position in which he stood ; * and he is even said to have formed some notion of character by this sense. † Another blind and deaf mute, Julia Brace, who is described as possessing a fine physical organisation, furnishes perhaps the most astonishing instance on record of acute scent. In fact, according to Dr. Howe's report, "smell seems to be the sense on which she most relies. She smells at everything which she can bring within range of the sense; and she has come to perceive odours utterly

* Dugald Stewart's *Works*, Vol. iv., pp. 314-316 (Hamilton's edition).

† *Ibid.*, p. 335, note.

insensible to other persons. When she meets a person whom she has met before, she instantly recognises him by the smell of his hand or of his glove. If it be a stranger, she smells his hand; and the impression is so strong that she can recognize him long after by smelling his hand, or even his glove, if just taken off. . . . She was employed in sorting the clothes of the pupils after they came out of the wash, and could distinguish those of each friend. If half a dozen strangers should throw each one his glove into a hat, and they were shaken up, Julia will take one glove, smell it, then smell the hand of each person, and unerringly assign each glove to its owner."*

The intellectual element involved in the perceptions of this sense explains the figurative applications of *smell*, *scent*, *odour*, *perfume*, *aroma*, *bouquet*, *fragrant*, *redolent*, and synonymous words in other languages. The word *sagacious* involves a figure derived from smell; and that is a suggestive figure also, which says of a laboured style, that it "smells of the lamp."

The intellectual superiority of smell to taste may not be at once obvious; but a brief review of what is implied in the facts already cited will make the superiority evident. Without referring again to the associations and comparisons that are, of course, involved in all perceptions, it may be observed that—

I. Smells are more easily *compared* than tastes both in presentation and in representation.

1. The sense of smell is not cloyed so soon as that of taste. This may be partly due to the finer form of the

* Dr. Howe, in the *Forty-third Report of the Massachusetts Asylum for the Blind*, quoted in Maudsley's *Physiology of the Mind*, p. 257

agency by which the organ is stimulated. While taste can be excited only by comparatively gross masses of liquid or solid food, odorous bodies act by means of practically imponderable particles. The result is, that the organ obtains more rapid relief from its stimulants; and they can, therefore, be distinguished even in some what close succession.

2. Odours are also capable of being more distinctly represented; and, accordingly, they enter much more extensively into the general stock of ideas, with which the mind is furnished. This will appear in illustrating

II. The *associability* of odours, which is likewise higher than that of tastes. For, as Dugald Stewart has justly observed, "the conspicuous place, which the sensations of smell occupy in the poetical language of all nations, shows how easily and naturally they ally themselves with the refined operations of the Fancy, and with the moral emotions of the heart."* The superior associability of odours implies that they are at once more suggestible and more suggestive.

1. They are suggested, not only with greater distinctness, but with quicker readiness. This is indicated by the frequency with which odours enter into the imagery of all literature; for that implies that they are readily revived by any association.

"O it came o'er my ear like the sweet sound
That breathes upon a bank of violets,
Stealing and giving odour."†

* *Works*, Vol. iv., p. 330, note (Hamilton's edition).

† *Twelfth Night*, Act I, Scene I. Most editors have substituted "scent" for "sound." Compare the passage in Milton's *Comus*:

"At last a soft and solemn-breathing sound
Rose like a steam of rich distilled perfumes
And stole upon the air."

Such similes imply a kind of comparison which we should scarcely dream of looking for in connection with tastes.

2. But the superior associability of odours is perhaps more strikingly exhibited in their *suggestiveness*. It has been already mentioned that James Mitchell used to discern by smell the position of a person in a room. This is analogous to the perception exhibited by any person of ordinary sensibility, who, on being surprised by an odour, hunts out the source from which it comes. It is evident, therefore, that, in the perception of externality, smell accomplishes what taste cannot do; it takes us beyond our own organism, and in suggesting the distance or direction of an odorous body, it gives a perception of abstract space. But vaster associations than those of mere locality are easily formed with smell. In *The Autocrat of the Breakfast Table* Dr. Holmes has, in his own charming way, illustrated how persons, events, scenes of a distant past may be suddenly recalled by a slight half-forgotten odour; and most men, who have reflected on the subject, will acknowledge that the illustration accords with their experience. The emotional associations of smell will be noticed more appropriately in the next part of this book. It has been well said, therefore, by Rousseau, in contrasting taste and smell, that "taste is the only sense which has nothing to say to the imagination. . . . Odours excite the imagination more than the sense, and affect us, not so much by what they furnish as by what they lead us to expect."*

There is thus a certain æsthetic quality in odours, which was sought in vain in tastes. This is due, of

* *Emile*, Livre ii., near the end.

course, to that refinement which, as already explained, consists in the ability to rise beyond the merely sensuous act. Such refinement, however, has not only an æsthetic, but a moral aspect, as will appear more fully in the third Part of this Book. The consciousness, raised beyond the sensation of the moment into a permanent relation, is delivered from bondage to a momentary impulse, becomes capable of determination by thought ; so that there is not in smell the intrinsic tendency, that there is in taste, to enslave the will to sensuous indulgence.

§ 3.—*Perceptions of Touch.*

Here there is a great advance in capacity for knowledge, and that especially in perceptions that involve the relations of space. The acuteness of tactual perception varies in different individuals, and even in the same individual at different times ; for it depends on the use that has been made of the hands. This is evident, not only for the general reason that all perceptions are developed by practice, but for the special reason that the sensibility of the fingers is necessarily affected by the use to which they have been put. It is a provision of nature for the protection of the sensitive true skin and the adjacent tissues, that any part of the body exposed to rough hard contacts develops a thicker cuticle. This, however, necessarily blunts the sensibility of the part so protected. It is, therefore, easily understood why we associate a hardened hand with rough manual labour, and never expect from it any power of delicate manipulation. On the other hand, a soft skin is usually combined with a corresponding fineness of touch.

The perceptions of touch may be divided in accordance with the two main varieties of tactual sensation,

which were seen to depend on different degrees of pressure, and on distinctness in the points of pressure. Both of these forms of touch were shown to be ordinarily associated with muscular sensations. All the common perceptions of touch, therefore, are in reality muscular perceptions as well. In so far as any idea of movement is involved, the perception is based almost entirely on muscular sensibility ; but the sense of touch is necessarily called into play in associating the movement with an extraorganic body in contact with the skin. Accordingly, in analysing the perceptions of touch, it must always be understood, even when it is not explicitly stated, that muscular perceptions are involved.

(A) The perception of *different degrees of pressure*, though ordinarily due to the assistance of the muscular sense, is still to some extent a perception of touch ; and it has been already observed that the experiments of Weber tend to show that the sensibility of the skin to separate points is a fair standard of its sensibility to different degrees of pressure. Thus the finger-tips can discriminate 20 oz. from 19·2 oz., while the obtuse forearm requires a difference of 20 oz. from 18·7 oz. before it can be perceived.

In ordinary life a valuable perception connected with this sensibility is the delicacy which the physician acquires in "feeling" the pulse of a patient. The most common perceptions of this sort, however, are probably those implied in the accuracy with which tools may be handled ; but as these perceptions involve a peculiar complication arising from the use of a tool, it will be convenient to reserve them for subsequent explanation. If we leave the ordinary perceptions of human life, the blind will furnish many extraordinary examples of acuteness in the perception of

which we are speaking. Thus the celebrated blind and deaf mute, Laura Bridgman, distinguishes her friends by the touch of their hands; and in this way she can retain the memory of a hand for years. She has also been accustomed to conjecture the degree of a visitor's intelligence by the muscular tonicity or movement of his hand, and at an early period she learnt to detect the hand of an idiot by its peculiar flabbiness.* Dugald Stewart cites instances of blind men who could feel their approach to a solid obstacle by the pulse of the air on the face.† It does not, indeed, seem necessary to be blind in order to acquire the perception. Many persons, while walking in the dark, have been prevented from dashing against some object in the way by a peculiar feeling which they may not have been able to explain. Yet the explanation is not far to seek. In walking we push before us a column of air, as a vessel, moving through the water, raises a wave at its bow. The wave of the atmosphere, which we bear before us, rolls on undisturbed till it strikes some resisting body, when it surges back upon us; and with the attention unusually strained to catch the slightest warning of an obstacle, it is not unintelligible that the increased beat of the air should be felt upon the face.‡

These perceptions of touch, however, must not be

* *Mind* for April, 1879, p. 162.

† *Works*, Vol. iv., p. 304, note (Hamilton's edition).

‡ Mr. Levy claims for blind men a peculiar sensibility in the face, which he calls the Facial Sense (*Blindness and the Blind*, pp. 64-8.) Though Maudsley seems to recognise the claim (*Physiology of the Mind*, pp. 213-4), yet such recognition is premature while the claim has not been subjected to the test of scientific experiment. It seems not improbable that the Facial Sense may resolve itself mainly into the perception explained in the text.

supposed to be intuitions. Like all other perceptions, they are products of association and comparison; they are efforts of intelligence to interpret various sensations of touch by connecting them with the various modes of pressure from which they arise. For these sensations may be due to varying weights, to hardness and softness, or to some peculiarity in the figure of a body, causing one part of its surface to press more strongly than another. All perception of such facts is the result of an intellectual process,—of association and comparison. This may be made evident by one or two simple experiments. These experiments are taken from a class of phenomena, which may be called illusory perceptions, and which are of great psychological value for the light they throw on the processes of intelligence. They show, that once an idea has been associated with some sensation, it may at any time be suggested by the sensation, even when it represents no corresponding reality. It is thus seen that the reality is not revealed by a direct intuition, but is simply suggested as the result of a previous association.

Our first experiment illustrates the suggestiveness of touches. It is evident that a convex surface, when drawn across the hand, tends to press more strongly in the middle than at the extremities, while the opposite is the case with concave surfaces. These inequalities of surface, therefore come to be associated with the varying degrees of pressure which they produce. Now, if a plane surface is drawn over the hand of a person blindfolded, it will appear convex or concave, according as the pressure is increased or diminished towards the centre, the differences of pressure suggesting irresistibly the convexity or concavity, with which they are usually associated.

Another illusory perception illustrates the suggestibility of tactual sensations. Heavy bodies, like the common metals, are usually colder than the skin; and therefore heaviness in a body comes to be associated with the feeling of its being cold. It is evidently a result of this association, that, if two bodies of equal weight, but unequal temperatures, are held in the hands, the colder appears the heavier.* This illusion is illustrated by another which is based on a similar association,—an association, namely, between weight and metallic lustre. It is told of Dr. Pearson, that, when he first received on his finger a globule of potassium which had been produced by Sir H. Davy's battery, he exclaimed, "Bless me, how heavy it is!" Many persons, influenced by the same association, must have felt a disappointment approaching to a sort of insipidity, in handling the lighter metals. In fact, any light substance like a soft wood, coated with a successful imitation of metallic lustre, suggests a heaviness, which we are amusingly disappointed not to feel.

(B) In the perception of *distinct points*, touch is usually combined with muscular sense by passing the finger-tips over the surface examined; and this is what commonly is understood by "feeling" a body. Apparently the friction thus caused excites the papillae more vigorously, while the movement, with minute bodies at least, avoids the insensitive spots of the skin, and at the same time varies the impression produced. In this way

* Professor Bain ascribes this illusion to "the depressing effect of cold" (*The Senses and the Intellect*, p. 172, 3d. ed.). This means, I presume, that cold lowers the muscular energy, and demands therefore a greater strain in sustaining a weight. To this it is an objection, that only an extreme cold has this effect; moderate cold is stimulating.

great delicacy may often be acquired in perceiving minute differences in the structure of surfaces and the texture of stuffs. It is by this delicate perception that the clothier detects the quality of a cloth, the miller and flour-inspector determine the grades of flour. Marvellous to others, and perhaps inexplicable to himself, is the accuracy with which a bank-teller detects the presence of a counterfeit among a thousand notes that are passing rapidly through his fingers. An astonishing illustration of the increased sensibility which may be given to touch by the concentration of intelligent attention upon its impressions, seems to be furnished by so-called thought-reading. The most distinguished of recent performers in this art, assures us that he pretends to no immediate clairvoyance of another person's thoughts, but that in his case thought-reading is simply "an exalted perception of touch." *

But here again it is among the blind that we look for the most extraordinary instances of acute perception. It is asked in an old play:—

" Whose hand so subtle he can colours name,
If he do wink and touch 'em ? " †

Nevertheless some of the blind are said to be capable of distinguishing colours by touch. This would mean that surfaces, which to sight produce sensations of different colours, reveal to touch also a perceptible difference: and this is *a priori* not inconceivable; for the peculiar structure of a surface, which makes it reflect only certain rays of light, and absorb all the rest, may, in some cases

* See an interesting article on *A Thought-reader's Experiences*, by Stuart C. Cumberland, in the *Nineteenth Century* for December, 1886, especially pp. 878, 884.

† Beaumont and Fletcher's *Knight of Malta*, Act i., Scene i.

at least, be perceptible to a delicate touch. Still the possession of this perception has been denied by some who claim large opportunities of observation. *

Nevertheless touch does at times acquire powers that are quite as wonderful. One of the most common and useful applications of an educated touch among the blind at the present day is the reading of a raised type. Laura Bridgman, we are told, "estimates the age of her visitors by feeling the wrinkles about their eyes, and tells the frame of mind of her friends by touching their faces, nearly as accurately as a seeing person could do." † In fact, when combined with muscular sensibility and aided by hearing, touch can compensate for the loss of sight to a degree which would be incredible, were it not authenticated by daily observations and unexceptionable evidence. In the annals of the blind, therefore, we have numerous examples of men and women who, in spite of their defect, have pursued with success, not only various branches of science, but also various industrial occupations, which must have involved a wonderful delicacy of touch. ‡

But for all men the most common and most important perceptions of this sense are those which refer to the separateness of different points, and which involve therefore the three dimensions of space,—linear, plane, and cubical extension. All those perceptions, which relate to the magnitude, figure, distance, and situation of bodies,

* See Mrs. Lamson's *Life and Education of Laura Bridgman*, p. 60; *Quarterly Review* for October, 1865. On the other side, see Carpenter's *Human Physiology*, § 738; and Todd and Bowman's *Physiology*, p. 376 (Amer. ed.).

† *Mind* for April, 1879, p. 162.

‡ Interesting information on these points will be found in Levy's *Blindness and the Blind*, especially pp. 336—372.

come under this head; for all these attributes simply mean the distance of different points from one another in different directions. Greater or less magnitude implies the greater or less distances between the extreme points of a body; figure is merely an expression for the distance at which the different points in the outline or surface of a body stand apart. In these perceptions it must not be supposed that touch reveals absolute dimensions. This supposition it is necessary to guard against; for in ordinary thought, and even among older psychologists, it is a common representation that tangible, as distinguished from visible, dimensions are the real dimensions of bodies, and that therefore the sense of touch corrects, by reference to reality, the illusory appearances presented by sight. This view, however, was exposed long ago by Berkeley, and has been thoroughly dispelled by the more accurate examination of tactile perceptions inaugurated in those experiments of Weber which were described above.* It is now known that the perception of dimension, as well as the perception of different degrees of pressure, is due to association and comparison. Indeed the philosopher, who was probably in modern times the greatest representative of the doctrine which holds that we have an intuitive perception of external reality, is quite as explicit as any other in denying any perception of extension in its real or absolute magnitude.†

To illustrate this let us take the perception of magnitude. Is there any absolute magnitude revealed to touch? On the contrary, the tangible magnitude of a body depends on the part of the organism with which it is in contact. It has been already observed that at some

* Book i., Part i., Chapter ii., § 4.

† Sir W. Hamilton in his edition of Reid's Works, pp. 881—2.

parts of the skin the points of a pair of compasses are felt to be distinct only when they are placed between two and three inches apart, while they can be distinguished by the tip of the forefinger when separated only by one twelfth of an inch, and even at the half of that distance by the tip of the tongue. As a result of this, two fixed points appear to be more distant when felt by a sensitive than when felt by an obtuse part of the skin. If the two points, therefore, are drawn from the soft part of the arm over the palm to the finger-tips, they appear to separate; while they seem to approach if drawn in the opposite direction. Consequently, a body impresses us as being of greater magnitude when touched by a more acute part of the organism. A familiar illustration of this is the fact, that a tooth, when touched by the tongue, appears larger than when touched by the finger. We should commonly express this by saying that the tooth appears larger than it really is; for our ideas of real magnitude are connected mainly with the special organ of touch, the finger-tips. But the unaided sensibility gives us no absolute standard of dimensions; and that is the reason why we are obliged to adopt independent instruments of measurement.

Take, again, the perception of the situation of bodies. This perception depends on the relative situations of the different parts of the skin that are touched. Now, the natural situations of these different parts may be artificially altered; and an illusory perception is the result, for suggestion follows the normal situation of the points of contact. Thus, if a pellet is placed between the two forefingers crossed, we seem to perceive, not one, but two bodies. The reason is, that the sides of the fingers touched cannot, in their natural position, be touched by a single body at the same time; and there-

fore the simultaneous touch of both by the pellet suggests irresistibly the idea of two separate bodies.

It is interesting to observe a remarkable accession of faculty in this sense, at least when it is combined, as it usually is, with the muscular sense. When any object, such as a stick, is held by one end in the hand, while the other end is brought against any resisting body, the hand feels a corresponding tactile impression. By association with its cause in the resisting body we learn to interpret this impression, so that it seems to travel along the object in the hand to the point where the resistance is made. The sense of touch is thus taught to bring within its ken bodies that are not in immediate contact with its organ; it learns to perceive the exact position which such bodies occupy in space, as well as their mechanical properties, their roughness and smoothness, their hardness and softness, and their weight. We speak, in fact, of *feeling* or *touching* a distant body by means of a stick or other instrument held in the hand; and the skill of the painter in handling his brush is often described as his *touch*. The value of this sort of touch for guidance to the blind is strikingly expressed by the ancient Greeks in the myth of the blind Teiresias receiving from Athena the gift of a staff, by which he was able to direct his movements as accurately as if he had been restored to sight. But for all men the vast extension of tactile and muscular perception by this means will be realised, when it is remembered that all the mechanical skill, which we owe to the use of tools, depends on the readiness with which the sensibility transfers itself to the point or edge of the tool used. It is by this transference of sensibility that man acquires all his marvellous accuracy in directing pen and pencil, chisel and knife, hatchet and sword,—in short, all the

various instruments by which he has made natural forces subservient to the necessities and enjoyments of his life.

By this extension of the sphere of tactile perception it has been ingeniously suggested that we may explain the fashion of carrying canes, of wearing large head-dresses, and other ornamental additions to the person, as if by such means the body were felt to expand in its proportions.* In this connection may be mentioned an equally ingenious explanation of the various actions which have been adopted as expressions of respect or humiliation in presence of a superior,—bowing, kneeling, uncovering the head or the feet,—as all involving the same idea, that of a diminution of the person.†

It needs but few words, beyond the exposition already given of tactile perceptions, to prove the intellectual superiority of touch as compared with taste or smell. That exposition has shown that the sensations of this sense admit of being more clearly identified and distinguished both in presentation and representation.

1. That the *actual sensations* can be more easily compared, must be evident from the fact that they may be discriminated, not only when occurring in rapid succession, but even when they are simultaneous. It is this discrimination of simultaneous touches, that enables us to perceive distinct points, and thus to attain all those perceptions which imply extension in its different dimensions.

2. It is equally evident that tactile sensations are more distinctly *representable*. A touch can be clearly revived in memory, and even referred in memory to the precise

* Lotze, *Mikrokosmos*, Vol. i., pp. 196—7.

† D. Stewart's *Philosophy of the Active and Moral Powers*, Vol. i., p. 248, note (Hamilton's edition).

spot on the periphery where it was originally felt. It must be this circumstance mainly that has led to the general use of skin-inflctions in the discipline of sentient beings; for it is obviously of prime importance in such discipline, that the pains, intended to deter from any act, should be at once such as are easily remembered, and such as are easily associated with the act, from which they are to deter. A remarkable proof of the distinct hold which touches may retain on the memory is furnished by not a few of the blind, after an interval of many years, recognising an old acquaintance immediately by the grasp of his hand. Gough, the blind botanist, had in his old age a rare plant put into his hands. After a brief examination he gave it its name, observing at the same time that he had met with only one specimen of the plant before, and that was fifty years ago.*

This leads to the additional observation, that touches are as easily associable as they are comparable,—that they are at once readily suggested, and powerfully suggestive. They fill, therefore, a much larger place, than either tastes or odours, in the memory and imagination of men. It is thus that “the touch of a vanished hand” is in itself so clearly revivable, and, even as a mere revival, is endowed with such power to recall the thoughts and emotions, with which it has been associated.

It might be expected, since touches can so readily form a vivid imagery, that they would enter extensively into the material of poetry; and yet the poetic value assigned to them is usually insignificant. This may be partly due to the slight emotional value of touches—an æsthetic defect, of which we shall have occasion to speak again. But another explanation is to be found in the

* *The Lost Senses*, by Dr. Kitto, p. 347 (Amer. ed.).

fact, that a large portion of tactile perceptions go to enrich the perceptions of sight, and consequently become absorbed in these. All ideas of figure, size, situation,—all the ideas that involve extension,—are in the ordinary mind indissolubly associated with sight, though undoubtedly derived in a large measure from tactile and muscular sensibility. But in those abnormal mental developments which, by reason of congenital blindness, have been unaided by sight, we can study more conveniently the separate contributions of touch to our intelligence; and it is evident, from such a study, that the place, ordinarily occupied by visual ideas, is represented in such minds by ideas derived from touch and the muscular sense. As a result of this it appears that, among the congenitally blind, poetical ideas are associated with touches quite as naturally as, among the seeing, they are attached to sights and sounds. Thus a man who was born blind writes:—"I take a strange and indescribable delight in passing my hands gently over highly-polished surfaces, especially if they are curved or undulating. Hard, rough surfaces, like those of sandpaper or unpolished metal, are extremely disagreeable to the touch. Angular figures, with fuzzy, glutinous, or adhesive surfaces, excite in the blind feelings of disgust, kindred, perhaps, to those experienced by the seeing, when the eye falls upon grim and dingy-coloured objects; while spherical bodies, with soft, smooth, or glossy exteriors, never fail to create the most pleasing sensations and impart ideas of fascinating beauty. Consequently, with these qualities, and sweet sounds, we associate our conceptions of beautiful colours."* The experience of Dr. Moyes was identical.

* *Beauties and Achievements of the Blind*, by W. Artmann and L. V. Hall.

"Polished surfaces, meandering streams, and gentle declivities, were the figures by which he expressed his ideas of beauty; rugged rocks, irregular points, and boisterous elements, furnished him with expressions of terror and disgust."*

§ 4.—*Perceptions of Hearing.*

These perceptions may be conveniently grouped in two classes; for some of them are founded on the general sensibility of the ear to all sorts of sound, others on its special sensibility to tones. The former may be described as perceptions of space, the latter as perceptions of relative pitch and quality.

(A.) With regard to the *auditory perceptions of space*, it seems scarcely necessary to say, that they are not immediate intuitions, through the ear, of spatial relations. Sound in itself implies no idea of space, of here and there, of long and short, of far and near. Sounds are sensations, differing in intensity, pitch, and quality, but indicating no relation whatever to the dimensions of space. These dimensions, in short, however they may be known, cannot be heard, any more than they can be tasted or smelled. How, then, do we learn to perceive space by sound? We acquire this perception in the same way as we acquire any other, by association and comparison.

This perception, as already remarked, is based on the sensibility of the ear to sound in general. Now, the property which all sounds possess in common is intensity, and different sounds can be compared—discriminated—in respect of their different intensities. Moreover, the

* *The Lost Senses*, by Dr. Kitto, pp. 342-3 (Amer. ed.).

different intensities become associated in experience with different relations in space. Accordingly, the intensity of a sound, after a certain length of association, forms a sign of the spatial relation with which it has been associated. There are two such relations which are thus made known—distance and direction.

I. The association, which forms the perception of *distance*, has been already mentioned. It is founded on the physical law, that the sound-waves in the atmosphere diminish in breadth, and therefore impinge with less force on the ear, the farther they have travelled. As a result of this, loudness becomes a common sign of proximity, faintness of distance. The association, indeed, is not absolutely invariable; but it is uniform enough to make the suggestion of the fact signified by the intensity of a sound almost as instantaneous as an immediate intuition. In those instances in which the familiar association is interrupted, there is usually some collateral circumstance which prevents us from being deceived. In the case of thunder and artillery, for example, we have generally learnt, from the familiar character of the sounds, that there is not necessarily any connection between their loudness and the close proximity of their source; on the other hand, the recognition of a sound as a whisper dissociates its faintness from the idea of distance. Still we are deceived often by the habit of this association, oftenest probably by a faint sound suggesting irresistibly a remote sonorous body. In fact, the art of the ventriloquist, apart from his histrionic power and his skill in mimicking various voices, aims at producing an illusory perception of hearing by imitation of the signs with which we have been accustomed to associate different distances.

II. The perception of the *direction* of a sound, that is,

of the situation of a sonorous body in reference to our own position in space, is also due to the discrimination of different intensities of sounds; but it implies that we discriminate the intensities of the sensations in the two ears. The ear, which is nearest to a sonorous body, will receive its sound with greater force; and from this fact we learn to recognise the direction in which the sound comes.

Here, again, in mature intelligence the process becomes so rapid from long association, that we fail to analyse it in ordinary perceptions. But the process may yet be detected in two circumstances. (1.) When we are uncertain about the direction of a sound, as we must be if its cause is right above or beneath, right in front or behind, we keep tentatively altering the position of the head, till we satisfy ourselves by catching the sound more strongly on one ear. (2.) It is the experience of persons who have lost the sensibility of one ear, that they lose also, to a large extent, the power of perceiving the direction of sounds.

Still there is ground for believing that this perception has been exaggerated, so far as it is supposed to be independent of any extraneous knowledge of the situation of audible bodies. When, for example, you are in a company of several persons, and are able to turn without hesitation to each whenever his voice is heard, your perception of the direction of the voice is, in all probability, to be ascribed mainly to your previous acquaintance with the peculiar tones of the various persons in the company, and with the various positions which they respectively occupy.

Though it is common to consider geometrical relations alone, like distance and direction, among these perceptions of hearing, yet sometimes physical properties also

are associated with sound, and thus perceived by its means. This is the case, for example, with the weight of bodies, which is apt to show a certain correspondence with the intensity of the sounds they produce. We thus distinguish easily the tread of an adult from the light footstep of a child, we detect at once the heavy foot of a man bearing a burden, and we can tell whether the vehicle which we hear passing down the street is a loaded waggon or an empty cart. Perceptions of this sort are, of course, peculiarly frequent and acute among the blind; and their appreciation of minute differences in the intensity and pitch of sounds forms one of the chief guides in threading their way through crowded thoroughfares.

(B) The value of the *musical perceptions* of the ear is evinced in the fact, that they form the basis at once of articulate speech and of the fine art of music.

I. *Articulate speech* depends on the power of discriminating the musical properties of sound. This is evident from an examination of the vocal organ of man, as well as of the elementary sounds, whose combinations form his spoken language.

1. The organ of the human voice is, in the strictest sense, a musical instrument of the reed sort. The structures, which play the part of reeds, are the vocal cords,—two elastic ligaments, which are stretched across the upper part of the larynx, and are thrown into vibration by the expired breath. In fact, in singing, the organ of the voice is used for strictly musical purposes.

2. The articulate sounds, produced by this organ, have from ancient times been divided into two classes,—consonants and vowels.

(a) The consonants—*literae consonantes*—are not, indeed, independent sounds; they can be sounded only

along with the vowels. They are simply checks on the vowel sounds, produced by obstruction of the breath after it has issued from the larynx ; and the difference of the consonants depends on the point where the obstruction is formed. Is the breath checked just as it leaves the larynx by a contraction at the top of the throat ? we have a guttural. Is it allowed to pass further, and arrested only by a pressure of the tongue against the teeth ? a dental is the result. Is it not stopped till we close the lips upon it ? then they produce a labial. Now, although to the philologist tracing the modifications of a word, or to the elocutionist anxious about distinct articulation, the consonants form the most important constituents of speech, yet phonetically they are not essential. A word may be formed without a consonant, but not without a vowel.

(b) The vowels—*literae vocales*—are independent sounds, formed by the current of breath being modified by the configuration of the mouth. A change in the configuration of the mouth forms it into a practically new instrument by giving it a different resonance ; that is to say, the mouth becomes thus tuned to a different key, and adapted to resound tones that are in harmony with it. The result is that with each new configuration of the mouth different overtones are brought into prominence ; and consequently the vowels are distinguished from one another by the quality of their tone. It is not necessary here to enter into details on this subject ; these will be found in Helmholtz's great work, which has been already mentioned.*

Of course it must be borne in mind that the sounds of the voice are merely the raw formless materials of

* *Lehre von den Tonempfindungen*, pp. 163-180.

speech. That there is a strong animal instinct to use vocal sounds for the expression of mind is evinced in the inarticulate cries of beasts and the musical notes of birds. A very striking manifestation of this instinct is the fact that Laura Bridgman, who was blind and deaf almost from her birth, produces vocal sounds which she can feel merely as muscular sensations in the larynx, and that she associates these with different objects, animate and inanimate, in the same way as we associate words with such objects as their names or signs.* The raw materials—the mere sounds—of articulate speech can be reproduced even by many of the lower animals, like the parrot, which have a powerful instinct of mimicry in this direction. But the essential form of language—the *syntax* or intelligent arrangement of articulate sounds—is never acquired by any of the lower animals. Syntax implies the connection of different thoughts as factors of a larger thought—the connection of different *parts* of speech as forming by their relation one organic whole. It is simply, therefore, a modification of that general action of intelligence which consists in association and comparison; but as quite distinct from any perception of hearing, it does not require further consideration here. The perception of articulate sounds, though a more humble, is still an essential part of the faculty of speech; and, humble though it be in comparison with the other, it involves a somewhat elaborate intellectual effort. The labour, accumulated in the effort, is disguised by the easy rapidity with which it is performed after long practice; but it is partially revealed to any one who sets about educating his ear to follow a foreign speech. The

* Mrs. Lamson's *Life and Education of Laura Bridgman*, pp. xvi.-xvii., 61-2, 84.

first impression of a foreign tongue is an unintelligible jabber; and it is a significant philological fact, that in many languages the words used commonly to denote a foreigner, like the Greek *barbaros* and the Teutonic *welsch*, seem to have expressed originally the idea of babbling or talking inarticulately.*

In fact, not a few phenomena in language are to be explained by the difficulty of catching distinctly the sound of unfamiliar words. Occasionally, for example, when two words are commonly used together, the final consonant of the one coalesces with the beginning of the other, or the initial consonant of the latter is attracted to the termination of the preceding. Of the former phenomenon we have examples in *a newt* for *an eft*, a *nickname* for *an ekename*; of the other, examples occur in *an adder* for *a nadder*, *un orange* for *un narange* (Spanish *naranja* from the Arabic *náranj*). Old manuscripts, at a time when spelling was less an object of care, and printing had not made orthography familiar, show numerous examples of such confusion. Another common confusion occurs when a word imported from a foreign language resembles the sound of a word in the language into which it is introduced. The familiar word is then made to do duty for the unfamiliar, even though the two may have no connection in etymology or meaning. Of this there is a well known example in the vulgar corruption of *asparagus* into *sparrowgrass*; and numerous additional illustrations may be found in works on the science of language.

II. The fine art of *music* is of course built up on the musical sensibility of the ear. It implies a power of

* See Renan, *De l'origine du langage*, pp. 177-181.

perceiving both of the musical properties of tone,—their pitch and their quality.

1. The perception of *quality* forms a considerable element of musical gratification; and this property, as we have seen, depends on the overtones by which a tone is accompanied. Simple tones, like those of a tuning-fork, which are nearly or altogether unmodified by overtones, being deficient in any pronounced quality, are felt to be weak, though agreeably soft. Those tones, again, in which the lower overtones, up to about the sixth, are most prominent, such as the tones of a piano or the open pipes of an organ, produce a richer, grander clang; while those, in which the higher overtones prevail, such as the tones of most reed-instruments, are harsh in quality, though valuable for some musical effects. The reason of this difference is, that the higher overtones form discords, the lower form concords, with the fundamental tone. It appears, therefore, that the appreciation of quality is akin to the appreciation of harmony; and this is a subject which will be immediately discussed.

2. The perception of relative *pitch* may apply either to consecutive or to simultaneous tones.

(a) In the case of consecutive tones the succeeding tone must be such as to follow without violent shock upon the preceding. This agreeable relation of successive tones is *melody*. To understand the nature of this relation, it must be borne in mind that, in a succession of tones, each preceding tone is apt to linger, if not in sense, certainly in memory, after the succeeding has been struck; and therefore a marked discord between the two tones would be disagreeable. This would be the case at least with the emphatic notes of a melody; and it seems that, in those airs which have been the delight of a people for generations, the emphatic notes are related by simple

and familiar concords. The nature, therefore, of a melodious succession of tones, like that of the quality of single tones, seems to point to the same source of auditory gratification, from which harmony derives its power.

(b) We are thus brought to the consideration of *harmony*, that is, the musical or agreeable relation of simultaneous tones. The complete explanation of harmony involves three problems, only one of which is strictly psychological.

(a) From *physics* harmony demands an account of its physical cause. This cause must be some peculiarity in the combination of the atmospheric vibrations producing the various tones that form a harmony. It is evident that different sound-waves, having a certain ratio, will coincide at regular intervals, while other combinations admit of no such coincidence. It is also evident that coincidences of this kind can be represented by the ratio between the numbers of the vibrations that produce the several tones of a harmony. A few of the more simple ratios are very obvious, and have long been familiar in music. Thus, when the vibrations of two tones stand in the ratio of $1 : 2$, that is, when two tones at an interval of an octave are combined, each beat of the air producing the lower tone will coincide with every second beat producing the higher. A similar coincidence will also obviously result from such simple ratios as $1 : 3$, $2 : 3$, $1 : 4$, etc. But it is unnecessary here to go into details, which belong to acoustics and the theory of music.

(3) To *physiology* also a problem is offered by harmony,—the problem of explaining the peculiar organic action that is set up during an harmonious combination of tones. Here we enter on a more obscure region, and must grope our way mainly by deduction from our general knowledge of the nature of nervous

action. It is commonly held that the effect of coincident atmospheric vibrations upon the auditory nerve is to produce a continuous nerve-current, while a discordant combination excites a confused set of intermittent shocks. The pleasantness of the one effect, and the unpleasantness of the other, will be considered in the next Part of this Book, when we come to discuss the nature of pleasure and pain.

(7) But the physical and physiological aspects of harmony are noticed here mainly to avoid confounding them with its *psychological* aspect. To the psychologist harmony is a phenomenon in consciousness. The consciousness here is very largely emotional, but it contains a cognitional factor as well. This factor appears, of course, most distinctly where it is most fully developed,—in the mind of a cultivated musician. To such the consciousness of harmony is a perception of some sort of coalescence between the combining tones, while in discord there is a consciousness that the tones will not coalesce. In its intellectual aspect discord may therefore be compared with the consciousness arising from the presentation or representation of objects, so numerous and so dissimilar, that the intellect is baffled in the effort to comprehend them in one cognitive act; and in its emotional aspect, as may appear more clearly in the sequel, discord may be classed with the more general feelings of distraction or confusion.

To prevent misunderstanding, it may be observed in passing, that of course there are other factors in music besides the perception of tone. There is, for example, the cognition of time, of which it need only be said here that the sense of hearing is a pretty fair measurer.*

* Time in music is essentially connected with *metre and rhythm*

There is also the æsthetic consciousness, which is common to music with the other fine arts. But the consciousness of time and of beauty opens up questions which can be discussed only at a later stage.

It is scarcely necessary to insist on the intellectual rank of this sense, as it is obvious that sounds are among the most readily associated and the most distinctly compared of all sensations. (1.) Their associability, that is, their suggestiveness and suggestibility are strikingly illustrated in the familiar use of speech; for the understanding of language implies that sounds have the power of instantaneously suggesting thoughts, as speaking implies that thoughts have the power of instantaneously suggesting sounds, as well as the muscular adjustments requisite for producing them. (2.) The comparability of sounds is also remarkable. We have already seen that, in succession, they must reach the number of about forty in a second before they become fused into one tone; and the power of a cultivated ear to discriminate minute differences of pitch or quality is often marvellous. The leader of a large orchestra can at once detect a false note, and turn to the offending instrument, while a tuner must recognise any variation, even to a small fraction of a tone, from the pitch which he is seeking to restore.*

With this high intellectual quality sounds have natur-

in versification, and the dependence of these on hearing is evinced by the fact that, while blind men have produced the most delicate charms of poetical structure, the annals of the deaf contain no great poets. See Kitto's *The Lost Senses*, pp. 140-4, where the author gives an interesting account of his own experience of deafness.

* Observations seem to show that a practised ear can detect a difference of pitch, when it depends merely on a fraction of a vibration. Wundt's *Physiologische Psychologie*, vol. i., p. 396 (second ed.).

ally entered very extensively into the materials of poetic art. Their artistic value, however, is most prominently exhibited in music ; but as the effect of music is chiefly, if not exclusively, emotional, this subject must be reserved for the next Part.

§ 5.—*Perceptions of Sight.*

It is by the agency of light, as we have seen, that the sense of sight receives its impressions ; and, consequently, by itself it can give us no information beyond what is involved in the sensations of light,—of pure light or of colour. But in mature life sight is the sense to which we commonly resort for most of our information regarding the external world, especially for such information as involves ideas of space,—the magnitude, figure, distance, and direction of bodies. There is, therefore, a more uniform association of these ideas with visual sensations than with the sensations of any other sense. The association will be shown to be, in some instances, practically invariable, and therefore irresistibly and instantaneously suggestive.

On this account, while it was comparatively easy to dissociate ideas of space from other sensations, it has been found more difficult to do so in the case of sight. Even in recent times attempts have been made to show that the unaided sight is capable of perceiving space, if not in all dimensions, at least in length and breadth. It is, therefore, advisable to adduce the evidence, on which it is now generally admitted that the eye, of itself, has no such perception.

(A) We shall take first the case of *plane* extension. This perception need not detain us long. It may be a question whether an indefinite consciousness of extension

is not involved in the consciousness of light and colour : that is a problem which depends on the ultimate analysis of the idea of space. But whatever may be the solution of this problem, it is certain that definite extension in length and breadth can never be actually perceived by sight alone. Take, for illustration, one form of plane extension, the magnitude of a body, that is, the extent which it covers on the field of vision. It is a fact familiar even to the child, that to sight a body appears smaller or larger in proportion to its distance, and that therefore the illusions of visible magnitude have to be corrected by reference to other standards of measurement. Consequently, the experience of persons born blind, and afterwards restored to sight,—an experience of which a more explicit account will presently be given,—tends to show that at first they could form no definite notion regarding the magnitude of bodies from their visible appearance. Thus the patient of Dr. Franz could not understand the significance of perspective ; it seemed to him unnatural that the figure of a man in the foreground of a picture should be larger than that of a house or a mountain in the background. It is a singular circumstance, which it is difficult to explain, but which is conclusive on the point under consideration, that both Franz's and Cheselden's patients, after the restoration of sight, saw for a time objects magnified, especially when in motion.*

* This fact recalls a well-known trait of the narrative in Mark's Gospel, viii., 24. The case of Cheselden's patient was complicated by the curious fact, that one eye was cured before the other, and gave rise to this illusion. When the second eye was cured, objects appeared to it larger than to the first cured eye, though not so large as they had appeared to this eye immediately after its cure. I have discussed the problem of this magnification in a short

From the same cause the variations in the apparent size of a body which form such a familiar fact to those endowed with sight, are unimaginable by the congenitally blind; and thus Cheselden's patient could not understand how his mother could have a portrait of his father in her watch-case, which seemed to him as impossible as putting a bushel into a pint-measure.

A similar inability is experienced in regard to the perception of figure, which is merely the outline of the extent covered by a body on the field of vision. Except in the case of a few objects with very simple outline, such as a sphere, the visible figure of a body varies with the point of view from which it is seen. Consequently, persons born blind, after being restored to sight, are unable for some time to distinguish by their visible appearance, even objects that are very different in form, and are obliged to have recourse to the familiar sensations of touch and muscular sensibility. Thus Cheselden tells of his patient, that "he knew not the shape of anything, nor any one thing from another, however different in shape or magnitude; but upon being told what things were, whose form he before knew from feeling, he would carefully observe that he might know them again; but having too many objects to learn at once, he forgot many of them; and (as he said) at first learned to know, and again forgot a thousand things in a day. One particular only (though it may appear trifling) I will relate: Having often forgot which was the cat, and which the dog, he was ashamed to ask; catching the cat (which he knew by feeling), he was observed to look at her stedfastly, and then setting her

down, said, 'So, puss ! I shall know you another time.'"
It may be added that Dr. Franz's patient was at first perplexed over the visible appearance of even simple geometrical figures, though he had made some progress in the study of geometry before his recovery of sight.

These facts make it evident that the visual perception of any definite plane extension is not an immediate and original intuition of the mind through the sense of sight, but must be explained as the result of a mental process.

(B) The same conclusion, however, is still more evident in the case of *solid* extension, which implies the third dimension of space,—depth, or distance from the eye.

I. The impossibility of *seeing* this dimension may, in fact, be said to be indicated by the very nature of vision.

1. To use a phrase of Berkeley's, distance is a line turned endwise to the eye. It is, therefore, only its end, not its length, that we see. Our condition may be illustrated by reference to a similar condition in the sense of touch. Were the end of a wire brought into contact with the hand of a person blind or blindfold could he tell its length? It might be but a short knitting-needle ; it might be an Atlantic cable : the touch of the end would indicate no difference of length. So a ray of light may come from a neighbouring gas-lamp or from a star countless millions of miles away ; it is merely the termination of the ray that strikes the eye.

2. All parts of a scene, however near some, however remote others may be, are presented on the retina at the same elevation, precisely as they would be represented on canvas by a painter. There is, therefore, nothing in the structure or action of the eyes to indicate various distances.

II. But it may be urged that such *a priori* arguments

are unsatisfactory, unless they are confirmed by facts. Indeed, however extraordinary it may appear in the face of these arguments, it will be shown in the sequel that, as far as can be judged from careful experiments on newborn animals of some species, these form accurate visual perceptions of distance and direction without requiring to go through any process of learning. But whatever explanation may be given of these observations on other animals, the experience of human life does not allow us to endow man with any such instinctive cognition.

To prove this the most conclusive evidence is that of infants, though it cannot be obtained by direct testimony, but must be gathered from their actions. It has long been familiar to mothers and nurses that children require some weeks' experience before they learn to notice things. The meaningless gaze of an infant, even when striking objects, like a lamp, are passed before his eyes, has long been regarded as showing that he is incompetent at first to interpret his visual sensations. But fortunately we are not left to the vague impressions of unmethodical observers; for within the last few years the mental development of infancy has been made the subject of numerous observations, conducted with the minute accuracy and precaution characteristic of modern science. From a large number of observations, directed specially to the development of visual perception, it appears that the child requires some weeks, or even months, to master the adjustments of the ocular muscles necessary to form a distinct retinal image, and that it is long after this power has been acquired before he can perceive by sight an inequality in the distance of objects. *

* *Die Seele des Kindes*, by Dr. Preyer (Leipzig, 1882), pp. 35-41. See especially the summary on p. 39. This work may be recom

This result of the observations made on infant life is happily confirmed in the most unequivocal manner by the experience of persons in maturer years who have been born blind, but afterwards restored to sight. A number of such cases have been recorded; but probably the most important, certainly the most accessible to an English reader, are those of which the reports are preserved in the *Philosophical Transactions*.* A selection of one or two passages from the first and the last of these reports will sufficiently indicate the conclusion to which they point.

1. The earliest case, and the one most frequently cited, is that of a lad born with a cataract of an unusually opaque quality. He was about fourteen years of age when the cataract was removed by Cheselden. The report of this case has been already cited in connection

mended as the latest, and probably the most complete, treatise on the infant-mind. Earlier works are mentioned by Wundt, *Grundzüge der Physiologischen Psychologie*, Vol. ii., p. 218, note 1, (2nd ed.). The work of M. Perez on *The First Three Years of Childhood*, though earlier than that of Dr. Preyer, has recently (1885) appeared in an English translation.

* The cases are these:—(1) Cheselden's, 1728; (2) Ware's, 1801, where there is reference to another (p. 389); (3) and (4) Home's two cases, which are of minor psychological interest, 1807; (5) Wardrop's, 1826; (6) Franz's, 1841. Another case is described in Nunneley's *Organs of Visions* (1838), p. 31. Additional cases are referred to by Helmholtz, *Physiologische Optik*, Vol. ii., p. 178 (2nd ed.); by Preyer, *Die Seele des Kindes*, p. 404. In making psychological inferences from the data of these cases, it should never be forgotten that the patients were but imperfectly blind, all being able to perceive the difference of light and shade, and therefore the presence of objects before the eyes, while some could even vaguely distinguish colours. It should also be borne in mind, that the patients had all reached a somewhat mature notion of space by the use of the other senses, if not also by their imperfect vision.

with the perception of plane extension. The following statements may now be adduced to show that the perception of the third dimension of space through the newly recovered sense had to be gradually acquired :—"When he first saw, he was so far from making any judgment about distances, that he thought all objects whatever touched his eyes (as he expressed it), as what he felt did his skin. . . . We thought he soon knew what pictures represented which were showed to him, but we found afterwards we were mistaken ; for about two months after he was couched, he discovered at once that they represented solid bodies, when, to that time, he considered them only as parti-coloured plains, or surfaces diversified with variety of paints ; but even then he was no less surprised, expecting the pictures would feel like the things they represented, and was amazed when he found those parts, which by their light and shadow appeared now round and uneven, felt only flat like the rest ; and asked which was the lying sense, feeling or seeing."

2. The other case to be cited is one in which superior accuracy seems to have been observed in making and reporting experiments. The patient was a young man, practically blind from birth, of good intelligence, well educated, and acquainted especially with geometrical figures. He was about eighteen years of age at the time of his cure. The report of the case was in after-life declared by the patient himself to be substantially correct.* After relating a number of interesting experiments, the report goes on :—"When the patient first acquired the faculty of sight, all objects appeared to him so near, that he was sometimes afraid of coming in con-

* See a letter of Mr. Mahaffy's in the *Athenaeum* for January 22nd, 1881, where there is an interesting notice of the patient.

tact with them, though they were in reality at a great distance from him. . . . If he wished to form an estimate of the distance of objects from his own person, or of two objects from each other, without moving from his place, he examined the objects from different points of view by turning his head to the right and to the left. Of perspective in pictures he had of course no idea ; he could distinguish the individual objects in a painting, but could not understand the meaning of the whole picture. . . . All objects appeared to him perfectly flat ; thus, although he very well knew by his touch that the nose was prominent, and the eyes sunk deeper in the head, he saw the human face only as a plane. . . . Even though he could see both near and remote objects very well, he would nevertheless continually have recourse to the use of the sense of touch."*

It thus appears that the visual perception both of solid and of plane extension is gradually acquired ; and therefore it is a problem for the psychologist to explain the process of acquisition. It will be convenient in this explanation to separate the two modes of extension.

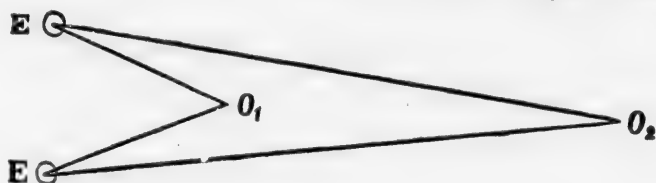
i. *Extension in Depth.*

Here there are two conditions of perception so different that it is necessary to consider them apart. The one involves the use of both eyes ; the other does not.

(A) *Binocular vision* affects the perception of depth only when objects are at no great distance ; for then the eyes must be turned in to see an object, and turned in the more, the nearer the object is. This will be evident

* *Phil. Trans.* for 1841, p. 66.

from the accompanying diagram, in which *E E* represent the eyes, and *O₁* an object near, *O₂* an object more



remote. Technically this fact is expressed by saying that the angle formed by the optic axes varies inversely as the distance. Consequently, since that angle diminishes with increasing distance, it is obvious that, when an object is very remote, the optic axes must be nearly parallel. This produces two effects on our sensibility, which are of great significance in the perception of depth in space—one a muscular sensation arising from the adjustment of the optic axes, the other a visual sensation determined by the different points of view from which the two eyes look at a near object.

I. It has been already mentioned that the eyes are supplied with an elaborate muscular apparatus, enabling them to move in every direction. The muscular sensibility is of course excited in the movement of the eyes, as they are turned inwards or outwards to see objects near or more remote; and the muscular sensations, thus invariably produced in adjusting the eyes to different distances, become uniformly associated with the different distances for which they are required. The result is that the distance associated with any particular adjustment of the eyes, is suggested irresistibly and instantaneously, appearing in consciousness as if it were immediately perceived.

This is no mere hypothetical explanation of the per-

ception of distance. It can be verified by the most satisfactory evidence. It is possible to alter the adjustment of the optic axes at pleasure without altering the real position of objects within the range of vision. We can thus observe the effect of this muscular adjustment without reference to any effect that might be produced by an alteration of the distance of objects. If there is an object before the eyes, and they are directed to a point in front of it or behind it, in the former case it appears to approach, in the latter to recede; and the suggestion of the appropriate distance is so irresistible, that one yields to it, even when it is known to be an illusion

II. The other guide to the perception of relative distances is a fact of visual sensation—the dissimilarity of the retinal images of an object. It must be evident, from the foregoing diagram, that this dissimilarity, like the angle formed by the optic axes, varies inversely as the distance of the object seen; in other words, the difference between the pictures formed on the two retinae increases as the object approaches the eyes. Another invariable association is thus formed, resulting in an irresistible and instantaneous suggestion.

Here, again, the process, by which the perception is formed, admits of complete verification both by positive and by negative evidence.

1. The appearance of depth in space—of solidity—may be artificially produced by imitating this natural sign. The stereoscopist takes two pictures of an object from the two different points of view from which it would naturally be seen by the eyes; and when these are adjusted so that each eye sees only the picture intended for it, the object stands out with all the appearance of solid extension which it possesses in reality.

▲ But this explanation is more powerfully confirmed by the negative fact, that the appearance of solid extension is not produced when a near object is seen with both eyes, if the images on both are identical. Thus two solid bodies, placed near at hand in such a position as to produce the same picture on both retinae, appear as to produce the same picture on both retinae, appear plane. But a more familiar illustration is found in the fact, that no painting, however skilful its imitation of nature may be, ever produces the stereoscopic appearance, when seen near at hand with both eyes. The reason is, that, if the object or scene represented were really before us, it would produce a different image on each eye, whereas the picture produces two images that are identical.*

An objection may perhaps, in some minds, be urged against this analysis on the ground that we do not see the two alleged pictures, but merely one object. In reply to this it is necessary only to point out, that we *do* see, and can at pleasure attend to the two retinal pictures. This may be made evident in various ways. We may, for example, by closing either eye, see the retinal pictures separately, when we shall find that the one eye sees more of the right, the other more of the left of an object. Or, again, we may direct the two eyes to different points of an object, and by this the spell of uniform association is broken. This may be done by holding an object before you, and directing your eyes to some point beyond it ; or

* This was discovered, nearly four centuries ago, by the genius of Leonardo da Vinci. See his *Treatise on Painting* (translated by Rigaud), p. 57. But the significance of the discovery remained unrecognised, till it was taken up and developed by Sir Charles Wheatstone in a celebrated paper on Binocular Vision, in the *Philosophical Transactions for 1838*, reprinted in his *Scientific Papers* (1879), p. 225.

if you cannot readily control the movement of the eyes by voluntary effort, you may by the application of a finger, push one eyeball out of the direction, to which it would naturally adjust itself. In either case the two retinal pictures will be at once apparent.*

But when the natural adjustment of the eyes is not interfered with, the presence of two dissimilar pictures on the retinae is invariably associated with the idea of a single solid body at a certain distance. It is infinitely more important that the mind should dwell upon the fact associated with the two pictures than upon the pictures themselves; and there is, therefore, nothing to check the suggestion of that fact. The two pictures, accordingly, seem to coalesce. In strict language, of course, they do not coalesce at all; they simply suggest irresistibly and instantaneously the presence of a single object, and they are not themselves noticed in the instantaneousness of the suggestion.

(B) The binocular vision of near objects, however, is itself materially assisted by various data, upon which the

* This might be illustrated further by some curious facts connected with squinting; but these are somewhat complicated, owing to the various causes to which this maladjustment of the eyes is due, as well as the peculiar habits of different patients. The student is therefore referred for details to Helmholtz's *Physiologische Optik*, pp., 699-701. Reid's *Inquiry* (Chapter vi., § 16) is not unworthy of reading still. The phenomenon of double vision may be compared with the double touch referred to above (p. 147); and a still closer analogue is found in the somewhat unfamiliar phenomenon of double hearing, which, I am led to believe, is due to one ear being less quick in its sensibility than the other. By the way, is it this cause of double vision that is noticed in *A Midsummer Night's Dream*, Act iv., Scene i.?

"Methinks I see these things with parted eye,
When everything seems double."

mind is obliged to depend entirely when no advantage can be derived from the use of two eyes. In looking at remote objects the axes of the eyes are virtually parallel, and the images on the retinae virtually identical; so that, in perceiving distance, we are limited to signs which do not depend on the inclination of the optic axes,—signs which are indispensable also in monocular vision.

I. Probably the most important of these signs is the visible or retinal magnitude, that is, the size of the retinal image. This, as even the child knows, varies inversely as the distance; and an uniform association is thus formed, with the usual result upon suggestion. This result may be artificially produced by varying the retinal magnitude without really altering the distance of an object. Such, in fact, is the artifice adopted for bringing remote objects within the range of distinct vision. By applying the laws of optics an instrument,—the telescope,—is constructed, which magnifies the retinal image of remote objects, and reduces in proportion their apparent distance. Thus a telescope, magnifying ten times, gives you a retinal image of the same size as if the object were ten times nearer; and the mind, instead of dwelling on the magnified image, rushes rather to the fact of increased nearness, which is commonly associated with such increase of visible magnitude.

The visible magnitude by itself, however, cannot tell the distance of an object. It is true, if an object is varying in apparent size, it may be known to be approaching or receding, as when a distant sail grows larger or smaller while we gaze on it. But to know the specific distance of a body from its visible size, we must have an idea of its size from some other source—from some other sense—besides sight. This requirement, however, is no serious inconvenience, as we have formed independent

ideas of size with regard to all the familiar objects of daily experience.

II. Another help to the visual perception of depth in space is the distribution of light and shade. On a plane surface light falls equally ; it is interrupted and falls unequally on a solid or a number of solids making up a scene. The unequal distribution of light and shade, therefore, becomes suggestive of the solid extension, to which it is due. The following facts may be noticed in illustration.

1. A skilful picture, seen with one eye, especially if isolated by a tube, produces the stereoscopic appearance, because the conditions of natural vision are, in one way, thus fulfilled.

2. For binocular vision solidity is easily imitated, provided the imitation be kept at a sufficient distance from the eyes. On lofty cornices or ceilings the appearance of *bas-relief* may be produced, though it should never be attempted in the imitation of pillars, which descend to the floor, and can therefore be approached by spectators. On this principle, also, are founded the popular exhibitions known as dioramas, in which pictures of life-size are exhibited on a stage at a sufficient distance from the spectators to fulfil the requirements of natural vision. It is said that in these exhibitions the illusion of reality is at times so irresistible as to have completely overcome some of the spectators.

3. An interesting experiment may be added. The visible difference between concavity and convexity consists in the fact, that in the former the shadow is on the side from which the light comes, in the latter on the opposite side. To determine, therefore, whether an object is concave or convex, we must know the side from which the light comes ; and if that be unknown, an

object may appear either concave or convex, sometimes at will. For this reason also a concavity, seen through an inverting telescope, appears convex; a convexity, concave. A curious illusion of this sort is mentioned by Sir David Brewster. One day, as he was walking with a lady on the sea-shore at St. Andrews, the footmarks and other indentations in the sand appeared to both to be raised. He explained this appearance by the fact, that, though the sunlight was on the right, yet on the left there was a bright fringe of white surf, which seems to have momentarily simulated the light that caused the shadows.*

III. A third sign of distance in space is the comparative sharpness or vagueness of outline, and brilliance or dullness of colour, with which objects are seen. These features in the visible appearance of objects depend on the interference of the atmosphere with the rays of light; and they vary, therefore, with the state of the atmosphere. The result is that, in an unusually clear atmosphere, bodies are apt to appear nearer, in a dull atmosphere farther off, than they really are. Accordingly, people accustomed to a humid climate find that, in a dry climate, they are often deceived by an illusory appearance of nearness. The same principle explains why it is that, in pictures, objects in the background must be sketched with less definite outline, and their colouring toned down, else they would simply appear to be small without being remote.

IV. The number of intervening objects also assists in the perception of distance, these being usually more numerous in proportion to the remoteness of the body seen. This explains the difficulty, especially for a lands-

* *On the Stereoscope*, Chap. 16.



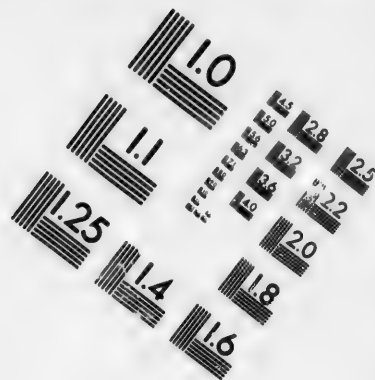
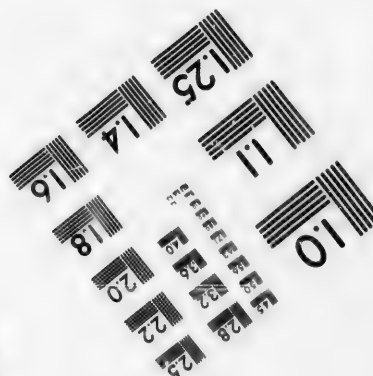
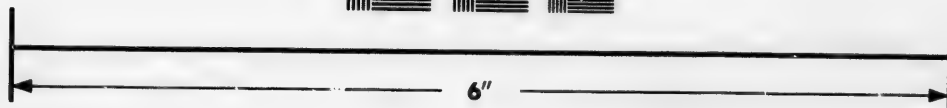
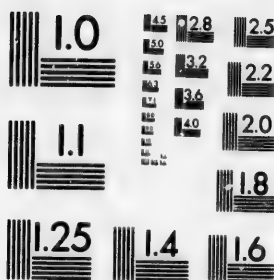


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic Sciences Corporation

**23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4303**

18 20 22 25 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92 96 100

10 01

man, of estimating distance at sea ; and a similar difficulty is also experienced by an unpractised eye on the prairies of the West or the vast desert plains of the East.

V. An additional assistance in this perception is derived from a somewhat obscure muscular sensation connected with the adjustment of the ocular focus. The distance of the focus behind a lens varies inversely as the distance of the object in front. In order to distinct vision it is necessary that the focus of the lens in the eye should fall exactly on the retina ; and consequently it must be variously adjusted in accordance with the varying distances of objects. The process of adjustment long formed a subject of dispute among physiologists ; but it is now generally ascribed to an increase in the convexity of the lens by the pressure of the ciliary muscle. This will explain why we feel a painful strain when an object is brought too close to the eye.

VI. As a guide by which we are frequently, if not always, directed in the perception of distance, may be mentioned the motion of objects across the field of vision. As the most of objects are stationary, their apparent motion is generally due to ourselves—to the movement of the whole body, or a turn of the head, or simply a sweep of the eye. In the apparent motion thus produced, the nearer objects are, the more rapidly do they flash across the field of vision, while they approach the appearance of being stationary in proportion to their remoteness. Such a very obtrusive phenomenon cannot be without its effect on our ordinary consciousness ; and, especially in a complicated scene, like a forest, it will be found that the idea of relative distances, obtained from a fixed gaze, is extremely indefinite when compared with that which is acquired by a series of glances that sweep the scene. This is confirmed by the experience of Dr.

Franz's patient. "If," it is said in a passage already cited, "he wished to form an estimate of the distance of objects from his person, or of two objects from each other, without moving from his place, he examined the objects from different points of view by turning his head to the right and to the left." An additional illustration will be found immediately below in an illusion produced by the rapid flash of objects across the field of vision in railway-travelling.

ii. *Plane Extension.*

The chief perceptions, involving merely plane extension, are those of magnitude and situation.

(A) The visual perception of the magnitude of a body is based on its retinal magnitude combined with any of the signs of distance. The retinal magnitude, as we have seen, varies with distance; and cannot, therefore, by itself signify real magnitude. It is for this reason that, in the illustration of objects whose size is unknown, the artist adopts the expedient of placing alongside for comparison some familiar object, such as a human figure. Consequently in order to judge of the real magnitude of an object by sight, its distance must be taken into consideration along with its visible magnitude. From this it follows that any cause, which affects our judgment of distance, will affect equally our judgment of size. If an object appears nearer than it really is, inasmuch as its real distance makes its retinal image comparatively small, it cannot but appear to be also of comparatively diminutive size; while, on the other hand, as a near object forms a comparatively large image on the retina, it must to appearance enlarge in its dimensions, if there is anything to make it seem farther off than it is in reality.

Among the more familiar facts illustrative of this may be mentioned the well-known illusions of magnitude produced by the comparative clearness or obscurity of the atmosphere. Objects seen through a fog, or even at night, whether by starlight or moonlight, always loom in vaster proportions, because, while they seem at an obscure distance, they yet produce a retinal image of undiminished magnitude. This phenomenon is so familiar that it is frequently alluded to in literature. Thus Tennyson speaks of

“ — Towers, that, *larger than themselves*
In their own darkness, thronged into the moon.”

But more beautifully Sir Bedivere is pictured in *Morte d'Arthur*:—

“ But the other swiftly strode from ridge to ridge,
 Clothed with his breath, and looking, as he walked,
Larger than human on the frozen hills.”

Again, the presence or absence of intervening objects, as it influences our perception of distance, modifies also our judgment of magnitude. Thus to a landsman's eye at sea distant bodies seem unusually small, because, owing to the absence of intervening objects, they seem nearer than they really are. Probably it is for this reason also that objects at the foot of a perpendicular height, when seen from the top, appear of diminished size.* On the other hand, it has long been observed that the moon on the horizon looks as if it were of larger diameter than when it has risen high into the heavens. The difference, indeed, seems to depend, in some measure, on the state

* A fine illustration of this effect is the imaginary description of the view from the cliffs of Dover in *King Lear*, Act iv., Scene 6.

of the atmosphere; * but it disappears to a large extent, if the horizontal moon is viewed through a tube which cuts off intervening objects.

Another illusion may be mentioned here, as experienced by some persons in railway travelling.† While a train is moving at the ordinary rate of railway speed, objects in the vicinity scud across the traveller's field of vision with a rapidity altogether unusual, and are apt on that account to appear nearer than they are in reality. But this produces necessarily also an apparent diminution in size.

To complete the explanation of the perception of magnitude, it ought to be added that, in the case of vaster objects, the perception is aided by the muscular sweep of the eyes or of the head, or even by pacing the ground. The latter alternative, however, introduces us to the artificial methods of measuring space, which are distinct from the estimates of natural vision.

(B) In speaking of the relative situations of different objects on the field of vision, we implicitly include the relative situations of different parts of the same object; and these relative situations constitute its visible figure. Situation, in this comprehensive sense, is perceived by data that are partly visual, and partly muscular.

I. The primary datum is visual; it is the fact that the portion of the retina affected by the light which a body radiates has an uniform correspondence with the position of the body in space. By invariable experience we learn that the position of a body is precisely opposite to the portion of the retina on which its light falls; in other words, by its essential structure the eye forms an inverted

* Helmholtz, *Physiologische Optik*, pp. 630—1.

† *Ibid.*, p. 635.

image of every object, of the whole visible world. It seems to have been a puzzling problem to many minds, that, with an inverted image of objects on the retina, we should still see them erect. But the puzzle dissolves at once if we bear in mind that the retinal image is not perceived by us, but is merely a sign suggestive of certain spatial relations. The suggestion, however, is governed, as in all other cases, by the laws of association. Now, in every-day experience we associate an impression on the right side of the retina, not with an object to the right, but with an object to the left; and a similar association is formed in the case of all other positions. Consequently all the associations of ordinary life suggest positions for objects the very reverse of those parts of the retina, on which visual sensations are felt.

Instead, therefore, of its being unintelligible that we should see objects erect by means of an inverted retinal image, it would be wholly unnatural,—it would imply a reversal of all the usual associations of life,—to see objects in any other positions than those in which they appear. Occasionally, indeed, new associations are formed, and it is surprising how rapidly perception adapts itself to them. The microscopist soon learns to move his object “instinctively” in the right direction; and in civilized life all persons acquire, at an early age, the faculty of dressing before a mirror, guided by an image in which right and left change their natural positions. But that such dexterities are acquired by a more or less gradual process, may be perhaps rendered more evident to those who have forgotten the process of acquisition, by recalling the awkwardness of any unusual association, such as the first attempt to use a razor or a pair of scissors under the guidance of an image in a mirror.

II. It has been already observed that the perception of distance is very materially assisted by the motion of the eyes. An equal value must be attached to their motion in the perception of situation. This can be tested in ordinary experience by comparing the vague result of a fixed gaze on a scene, where the relative positions of objects are not otherwise known, with the distinct idea obtained from a series of shifting glances. It thus appears that this perception is aided by the association established in daily experience between the external position of an object and the muscular feeling of adjusting the eyes to look at it. This statement finds an interesting confirmation in the results that are sometimes observed to follow from paralysis of the ocular muscles. Cases are mentioned, in which the *rectus externus*,—the muscle that pulls the eye horizontally outwards,—has been paralysed by a sudden injury. The patient, however, will continue making ineffectual efforts to move the eye in the direction in which it was wont to be drawn by the paralysed muscle. There is, therefore, excited in consciousness a feeling of effort, though it is followed by no overt movement; that is to say, the patient feels as if he were looking in a different direction, while the scene represented on the retina remains unchanged. By an irresistible suggestion, therefore, the whole scene appears to shift in the direction which has been uniformly associated in his mind with the felt effort of adjusting the eye.*

It remains to be added that the direction in which we are looking depends on the adjustment, not only of the eyes, but also of the head, and that therefore the mus-

* Wundt, *Grundzüge der Physiologischen Psychologie*, Vol. ii., p. 91 (2nd ed.)

cular feeling connected with this adjustment forms a factor in the perception of situation.

Concluding Observations. There are a few points connected with visual perception, which could not so conveniently be introduced into the above exposition, and may therefore be now noticed at the close.

I. The perceptions, whose acquisition has just been explained, seem to be congenital in some of the lower animals; and this fact has sometimes appeared to militate against the theory that they are not possessed at birth, but must be gradually formed, by man. Attempts have been made to question the correctness of the usual interpretation put upon the actions of those young animals that seem to direct their movements by sight almost from the very moment of birth. With regard to some of these animals, certainly, observations have yet to be made with sufficient care to show that their first movements might not be directed with equal accuracy by extraordinary acuteness of smell and muscular feeling. But the experiments of Mr. Douglas A. Spalding have apparently placed it beyond doubt, that the chick of the domestic hen, as well as the young of some other birds, are able to perceive by sight all dimensions of space as soon as they are fairly out of the shell.* The explanation of this congenital perception belongs to Animal Psychology. It forms, in fact, a part of the general problem of instinct. But, even if the perception is admitted to be instinctive in some of the lower animals, the admission would simply accord with the obvious fact, that several powers, which are instincts in other animals, must be slowly acquired by man.

* These experiments are related by Mr. Spalding with interesting detail in an article on *Instinct* in *Macmillan's Magazine* for February, 1873.

II. It is impossible to over-estimate the extent or the value of those ideas which we receive through the sense of sight, and difficult, therefore, to describe the mental condition of a man born blind. To interrogate such a person philosophically would throw light on many an obscure problem, and has therefore been justly described by Diderot, as "an occupation worthy of the united talents of Newton and Descartes, of Locke and Leibnitz."* The chief difficulty of such an investigation is the fact that the blind must use the language of other men. Now, as a very large proportion of our ideas are derived from the sense of sight, a very large proportion also of the words that we employ can find their full interpretation only in visual ideas. Accordingly we are apt to be misled by the blind man's employment of our language, and to take for granted that he attaches to that language the same meaning as ourselves. But notwithstanding this difficulty, the following facts are obvious.

1. The fundamental deficiency of the congenitally blind consists, of course, in their inability to *feel*, and therefore to *imagine*, light or colour. At times, indeed, they hit upon happy expressions to describe differences of colour in certain aspects. Such is the well-known description of red as being "like the sound of a trumpet," ascribed to a blind man by Locke. So also the blind Dr. Moyes remarked that red gave him a disagreeable sensation like the touch of a saw, and that the other colours decreased in harshness towards green, which gave him an idea like that of passing the hand over a polished surface.† It is obviously natural that the blind should

* D. Stewart's *Works*, Vol. iv., p. 304. (Hamilton's ed.).

† See above, pp. 151-2. An interesting analogue to these comparisons is found in the experience of a deaf man, to whom the sound

form their conception of colours, either from sounds or from touches or from both, as these are the most important sensations left to them. But all such comparisons bring out, only the more clearly, the insuperable defect in the physical sensibility of the blind. They point to the analogy between colours and other sensations in certain *general* characteristics of all feeling; they do not express the *special* characteristic of colour: they describe wherein the sensations of colour resemble, not wherein they differ from, other sensations.

2. As a result of this defective sensibility there is a corresponding defect in the power of perception. Body, as body,—as extended,—the blind perceive only through the tactile and muscular senses; and though they can recognise the existence of objects at a distance from the organism by an instrument in the hand, by sound, or even by smell, yet they are unable to comprehend an agent which can bring within the ken of sense bodies that are millions of miles away, so that their mechanical and other properties may be made the object of scientific investigation. This inability is strikingly indicated by several attempts, made by blind men, to describe visual perception. Thus M. du Puiseaux, the blind son of a Professor of Philosophy at the University of Paris, is said to have remarked:—"The eye is an organ on which the air* should have the same effect as my stick on my

of a trumpet seemed like yellow, of a drum like red, of an organ like green, etc. (Maudsley's *Physiology of the Mind*, p. 93, note).

* He has no conception of *light*, merely of a substance which can be felt by contact. It may be interesting to compare the case of Massieu, who was stone-deaf from birth, and who, in trying to conceive sound, imagined that persons hearing "*saw* with their ears" when they could not see with their eyes, as, for example, by night. Kitto's *The Lost Senses*, p. 158, (Am. ed.).

hand,"—that is, a kind of touch. When asked if he would not like to be restored to sight, it is not, therefore, surprising that he should have replied :—"If it were not for curiosity, I would rather have long arms : it seems to me that my hands would teach me better what is passing in the moon than your eyes or telescopes ; and, besides, the eyes cease to see sooner than the hands to touch. It would, therefore, be as well to improve the organ I have as to give me the one I want."*

We have seen that an extension of touch is obtained by the use of instruments ; and this distant contact seems to have afforded to the blind poet, Dr. Blacklock, an approximate conception of vision, though still only a conception of touch. He states that, when awake, he could distinguish men only in three ways, viz., by their voices, by feeling their heads and shoulders, by listening to the sound and manner of their breathing. But he adds that in dreams, he had a distinct impression of objects in a different way,—in the way of a distant contact effected by threads between himself and t

As illustrating further the mental condition of a congenitally blind man, it may be added that, after recovering sight, he takes some time to acquire the power of imagining visual perceptions, that is, a visual space that is not actually present. Thus it is related of Cheselden's patient, that at first he was "never able to imagine any lines beyond the bounds he saw ; the room he was in he said he knew to be but part of the house, yet he could not conceive that the whole house could look bigger."

* *Quarterly Review* for October, 1865.

† *Abercrombie's Intellectual Powers*, p. 220.

§ 6.—Muscular Perceptions.

There is only one of the general senses that is of very great value in furnishing materials of cognition, and that is the muscular sense. Accordingly, in quitting the perceptions of the special senses we shall confine our attention to muscular perceptions.

The muscular sensations, from which most perceptions are derived, are those of a dead strain, or of slow movement. The sensations of rapid movement are generally too exciting to admit of being calmly examined, and used as materials of knowledge; while, even in the case of a dead strain, the strain must be moderate, as an excessive strain is apt to deaden the sensibility.

I. The first and fundamental perception of this sense is that of the degree of muscular effort put forth. The sensations of muscular effort may, of course, be associated and compared like others; and the readiness of suggestion, as well as the acuteness of discrimination, thus originated, are marvellous. It is upon such perceptions that general dexterity, as well as gracefulness, of movement depends. Some of the muscular perceptions have been already noticed in connection with the perceptions of touch, where it was shown that the latter would be comparatively insignificant without the aid of the former. Here, therefore, it may be sufficient to notice an example or two of special muscular acuteness. It was shown, in the preceding section, how the ocular muscles are called into play in judging the relative distances of visible objects; and it must be obvious that the muscular adjustments, required for the minute differences of distance which we can easily appreciate, can differ only in a very slight degree. This case illustrates the suggestiveness of muscular sensations; the next

furnishes an example of their suggestibility. The tones of the voice are produced by means of the laryngeal muscles, aided, in speaking and singing at least, by the complicated muscular apparatus about the mouth. When we reflect on the manifold modulations of the voice, even in ordinary talk, when we consider that a good singer can easily produce notes that differ only by a fraction of a tone, we can scarcely avoid wonder at the refinement of muscular perception which renders possible this delicacy of adjustment.

II. The counterpart of this perception is that of the resistance which the muscular effort overcomes. This perception implies the association of muscular sensations with other sensations, visual and tactual. The muscular effort, which we are conscious of putting forth, becomes thus connected with the world of sights and touches, and that world accordingly shapes itself in our consciousness into a world of objects that are not only visible and tangible, but offer resistance to our efforts. It is only by this process that we form the complete notion of body and matter. Other sensations, indeed, discover that which is independent of my will : for I cannot choose but feel them when exposed to the conditions of their production. But this consciousness of a thing which is different from me, and does not depend for its existence on my volition, becomes obviously most distinct with the consciousness of a resistance presented to my voluntary exertion. Of course, we do not require to obtain first the incomplete notion of the material world, furnished by other senses, before we learn by muscular play that it is a world of resisting bodies ; for the muscular activity is incessant from the moment of birth. It is from the sensibility excited by this incessant activity of muscle, that we obtain the materials to build up our conception

of the world as a vast system of bodies endowed with force to resist ourselves.

It is in its mechanical aspects that matter is thus made known, these aspects being so many forms of force resisting our muscular efforts. It is the function of physical science to investigate these forms of force, with the view of arranging them into a systematic classification, and ascertaining precisely the laws in accordance with which they act.

CHAPTER II.

GENERALISATION.

THIS form of cognition contrasts with perception as the knowledge of classes with that of individuals. It has been usually analysed into three stages: Abstraction, Generalisation proper, or Classification, and Denomination. There is a convenience in adapting our exposition to this analysis.

§ 1.—*Abstraction.*

The nature of abstraction may be explained by dwelling upon two facts:—(1) that it is the counterpart of attention; (2) that it is merely an exercise of thought or comparison.

I. Abstraction is the counterpart of attention. Attention is the concentration of consciousness upon one among the multiplicity of phenomena. Now, as human consciousness is limited in its power, it cannot be concentrated upon one phenomenon, without being to that extent withdrawn from others. This *withdrawal* constitutes the mental act of *abstraction*.* The act of abstrac-

* If it be worth while to adhere to technical language in this matter, it may be observed that, according to that language, the phenomenon attended to is spoken of as being *prescinded*, while the

tion is therefore one form of the general limitation of human energy. The force which is organised in the individual is essentially limited ; and, when it is largely absorbed in one form of activity, cannot be at disposal for others. Thus it is well known that the excessive expenditure of human energy in intellectual toil, and still more in emotional excitement, is apt to interrupt vital actions, like digestion, at the time, and, if prolonged, to issue in chronic dyspepsia. Now, an act of attention on the part of any individual implies a discharge of his energy mainly in the direction in which consciousness is concentrated ; and it is therefore often accompanied by that "inhibitory action," as it is termed,* by which the functions of various bodily organs are apt to be interrupted. A man frequently finds himself thus arrested in the midst of any act in which he is engaged ; he may be brought to a stand-still, while walking in a crowded thoroughfare, and remain absorbed in his own thoughts, oblivious of the stream of passengers jostling against him in his awkward position. Even a large assembly of men, when their attention is rapt by an entrancing outburst of oratory, are at times checked in such an essential act of vitality as breathing, as may be evinced by the long sigh that is drawn at any pause. It will be seen therefore, that the state which is popularly described as *absent-mindedness*, is essentially identical with abstraction. A person in this state is absent mentally, that is, has his

mind is said to be *abstracted* from others. The notion of a prescinded phenomenon is what we mean by an *abstract* notion, while the notion of the same phenomenon in its actual connections with other phenomena is *concrete*. See Hamilton's *Lectures on Metaphysics*, Vol. ii., p. 29^c, with notes.

* Ferrier's *Functions of the Brain*, pp. 70-1 (2nd ed.) Compare also pp. 460-8.

mind abstracted from the concrete actualities around his body; but this arises from the fact that he is present mentally,—that his attention is engrossed,—with something else. Consequently, the stories of absentmindedness, which are met with in anecdotal biographies, may be taken as illustrative of the mental phenomenon under consideration.

II. But it is still more important to observe, that in its essential nature abstraction is an act of thought, that is, of comparison. It is, in fact, simply that discrimination,—that separation in thought,—which begins and continues with every step in the progress of knowledge. Abstraction and attention are, therefore, not only identical with each other; they are identical with the process of cognition itself. The fact signalised in these expressions is simply the intensification of a certain element which is implied more or less in all knowledge, but obtrudes itself more prominently in the careful procedures of the knowledge that is distinctively called science. The presence of this element will be realised, when it is borne in mind that, although for the necessities of scientific abstraction we discriminate cognition and feeling and will, yet such abstraction does not represent the concrete facts of mental life. Now, attention implies that the consciousness is strained in a particular direction by some involuntary impulse or by a voluntary effort. The involuntary impulse may be either sensational or emotional. The attention may be absorbed in a sensation of excessive pleasure or excessive pain; it may be rivetted on an object of some irresistible emotion, such as a passionate fondness or a paralysing fear. But the crowning triumphs of intellectual concentration are to be found in those efforts of voluntary attention or abstraction, by which the cultivated mind girds itself for the un-

impeded pursuit of truth. The necessity of such concentration in all forms of culture points to the dependence of intellectual greatness on a certain kind of moral greatness,—on the power of will “to scorn delights, and live laborious days,” in order to the attainment of a philosophic or artistic ideal. For practical wisdom, therefore, as well as for insight into the theory of abstraction, the student may read with profit the interesting citations, which Sir W. Hamilton has collected, from the testimony of great men, who have ascribed any intellectual eminence they have attained to their superior power of attention.*

Abstraction then may be said to be an artificial act of thought, in so far as it separates what are conjoined in nature. We never find, and cannot even imagine, one object or one aspect of an object, existing apart from all others. On the contrary, every object holds some relation to other objects, and the various parts or the various qualities of an object appear in our consciousness as if they had *grown together*, that is, had become *concrete*. But while abstraction breaks up this natural concretion of the parts and qualities of things, it is not to be supposed that the act is unnatural. It is rather a necessary movement of intelligence; for to have intelligence of any object is to think it as marked by this or that quality, as made up of this and that part. We can therefore comprehend the complex phenomena of nature only by breaking them up into parts and qualities. Thus, when a plant or an animal is submitted for examination, if we would make our knowledge of it exact and complete, we must study apart the different organs of which it is formed, or the qualities, such as colour and figure, which constitute its different aspects. The relations also, in which one object

* *Lectures on Metaphysics*, Vol. I., pp. 255-261.

stands to another, may be separately considered ; we may investigate their relations in space or their relations in time, their resemblances or their points of contrast, or their adaptability to various ends. Thus any of the multitudinous facts in the confusing complication of the phenomena presented in consciousness may be made an object of abstract attention, and the entire complication may be completely evolved into distinct cognition. The very organisation of a human being adapts him for this decomposition of a complex phenomenon, inasmuch as many of its factors,—its sensible qualities at least,—are made known to him through separate organs.

To guard against misapprehension, it only remains to add that an abstract notion, as such, is not yet necessarily general. I may attend exclusively to some aspect of an individual ; and so far I form an abstract notion that is singular. This observation may be useful owing to the fact, that the terms, *general* and *abstract*, are often used convertibly in popular language, and even by some psychological writers who have been influenced by the usage of Locke. The reason of this confusion will immediately appear.

§ 2.—*Generalisation Proper.*

The fact is, that in the natural evolution of consciousness the abstract notion never rests at the stage of singularity. This must be evident from the nature of the process of perception, which was described at the beginning of the previous chapter. It was there shown that even in perceiving the individual we assign it to its class, that is, we identify one or more of its qualities with one or more of the qualities of other individuals. There is not, therefore, the radical distinction, which the

old psychologists supposed, between the perception of an individual and the conception of a class. As we proceed, they will appear rather intellectual acts of the same complex nature, with the general element subordinated in one case, and brought into prominence in the other. In fact, it may sometimes happen to be doubtful, whether our consciousness should be described as individual or as general in its reference. Suppose, for example, the word *apple* is spoken. That word will bring up an image, more or less vague, of the object it is used to denote. But this image may be thought as representative of all similar objects, or merely as representative of some particular apple that I saw or ate to-day. In the former case, my consciousness is to be regarded as the concept of a class ; in the latter, as the imagination only of an individual.

It appears, therefore, that in all cognition there is a general factor, which receives prominence in the cognition of a class, but retires into a subordinate place in the cognition of an individual. This factor is that which, when disconnected from the rest, is spoken of as an abstract notion. An abstract notion, as we have seen in the previous section of this chapter, is a consciousness of some quality or aspect of an object considered without reference to others. When a quality, of which an abstract notion might be formed, is cognised in actual connection with a certain set of other phenomena, the cognition is a perception ; the notion of the quality loses its abstractness, it becomes concreted with the other phenomena. The notion of a quality loses its abstractness also when it becomes general ; but in this case it is conceived as in possible connection with numerous sets of phenomena. Thus the cognition expressed in "I perceive this quadruped" implies the connection of

fourfootedness with an individual set of phenomena; while the cognition, "I conceive a quadruped," implies the connection of the same quality, not with any definite set of actual phenomena, but with an indefinite number of possible phenomena. In other words, the notion of a quality, which in itself is an abstract notion, becomes general when it is thought as applying to various individuals, as it is singular when it applies only to one.

The evolution of general notions has formed the subject of a controversy known in former times as the question of the *Primum Cognitum*.* The controversy deals with the problem, whether our knowledge, and therefore our language, begins with classes or with individuals. Two antagonistic theories most readily suggest themselves to the mind,—one holding that knowledge starts from individual objects, and ascends from these to classes, another that the evolution of intelligence is in the reverse way. The young student of psychology is apt to be perplexed at first by the array of facts which each of these rival theories is capable of summoning to its support. We are now in a position to see that either theory expresses a part, but only a part, of the truth, and that there is a point of larger view which embraces the partial truth of both.

1. Our analysis of perception, in its various complications, has dispelled the popular mistake, which still infects much of our scientific literature, that the individual is a ready-made object, presented to the mind by an

* Of this controversy, an interesting historical and critical sketch is given by Sir William Hamilton in his *Lectures on Metaphysics*, vol. ii., pp. 319-332. Some interesting remarks on the question, from a philological point of view, will be found in Max Müller's *Lectures on the Science of Language* (First Series), pp. 373-386.

indecomposable flash of intuition. The cognition, by which the individual is revealed to consciousness, might rather be compared to a many-coloured light, whose variously-tinted rays are brought by the mind itself to the focus of distinct vision. In other words, an individual object of perception is the result of an intellectual process; and the process is one that continues with every definition of individuality, with every extension of our insight into the attributes, by which an object is differentiated from all others. It is evident, therefore, that our knowledge cannot *begin* with individuals.

2. But it would be equally incorrect to suppose, that knowledge starts from classes. The child, indeed, learns at an early period certain broad differences between things; but these differences remain for a long time very broad, and it is only after a considerable evolution of intelligence, that they are narrowed down to definite characteristics, and conceived as belonging in common to a number of individuals which are thus constituted into a distinct class.

It cannot, therefore, be said that knowledge begins with what is definitely general any more than with what is definitely individual. Since neither of these alternatives is admissible, there is but one conclusion to which we are shut up: knowledge must begin with something that is indefinite. Now, we have seen, in Book I., that the raw materials of knowledge, as of all mental life, are sensations. It is true, these cannot, as such, be called cognitions; but cognition begins with the definition of sensations in consciousness, that is, with the identification of those that resemble, and the discrimination of those that differ. Whenever I become conscious, however vaguely, that a sensation experienced now differs from other sensations, and yet resembles some sensations

felt before, the sensation becomes to that extent defined, that is, definitely known. Every advance in knowledge, moreover, is a progress towards the more definite discrimination of a phenomenon from those that are different, and its more definite identification with those which it resembles. This, however, is merely another way of saying that the evolution of knowledge is in the direction at once of more definite individualisation and generalisation.

With regard to the *Primum Cognitum*, while neither of the above-mentioned rival theories can be maintained in its exclusiveness, it is not to be overlooked that the perception of the individual is an easier process of intelligence than the conception of a class; and therefore it was observed above, that naturally the perception of the individual comes first in the evolution of intelligence. For, although the individual is not a simple object apprehended by an indivisible act of cognition, yet its complexity is based mainly on the natural associations of space and time; the individual is a concretion of nature. But in the conception of a class the mind requires to abstract from the concretions obtruded on it by nature, and to form a combination of its own among individuals that are related, not by spatial or temporal associations, but merely by resemblance. It is for this reason, that concrete thinking is commonly more natural than that which is abstract or general; while concrete forms of expression are most readily intelligible, and are therefore always to be preferred in addressing children or untutored minds.

Accordingly it is not incorrect to regard generalisation as a measure of the mastery of nature by human intelligence. It is true that even the perception of individuals is a certain mastery of intelligence over the confusing

variety of nature ; it is also true, as we have seen, that perception implies a certain generalisation, for the individual perceived must be referred to its class ; and it is true still further, that every ascent in generalisation extends our insight into the nature of individuals by unfolding their relations to one another. Still, it is by knowing the unities that pervade nature, rather than by acquaintance with a multitude of individuals, that nature becomes intelligible. Particulars, even when cognised as individual objects, are so multitudinous and so various, as to be hopelessly perplexing to the limited understanding of man until they are reduced to some kind of comprehensible unity by classification. The grouping, therefore, of any number of individuals into a class by the recognition of some feature common to them all is man's intellectual conquest of their perplexing multiplicity. The whole class of objects can then be treated as a single object of thought ; and, by the discovery of a resemblance between it and other classes, we may ascend to a higher genus which embraces them all. This process, which is the process of science, may be carried on till we reach some supreme generalisation, in which all the subordinate classes shall find their appropriate place.

At low stages of culture, as might be expected, this process has advanced but a short way. It appears from the languages of many savage tribes, that they have not reached the higher classifications that are familiar among civilised men, though they often possess a luxuriant growth of expressions for the lower species. In some Australian languages, for example, there are no generic names for tree, fish, or bird, but only specific names for the different kinds of each. The languages of the uncivilised races are said to be also extremely deficient in abstract terms. Of a piece with this is the ex-

tremely limited capacity of savages in regard to numbers, the limit in many cases being apparently the five fingers of one hand, or at most the ten fingers of the two.*

But the truth of all this must be understood as by no means implying that the savage has reached definite individualisation before reaching definite generalisation. It is true, that a comparatively uncultured mind sometimes attains a peculiar definiteness of individualisation. This is illustrated in the familiar fact, that a peasant will distinguish from one another his sheep and cattle, which seem to many a cultured mind destitute of any individual differences. But this arises from the circumstance of the rustic intellect being largely expended on the observation of such individual differences; and it is important to bear in mind, that the marks, by which to such an intellect one object is distinguished from another, are often of that insignificant character which is due to an accidental association in time or place; they are not those essential attributes of an object, upon which the scientific intellect would fix in forming its discriminations. At this stage, therefore, the mind is still in bondage to the combinations of nature; it is only when the mind asserts its own free activity, that it learns to recognise individual differences which depend on general laws, and not on casual associations. The progress of knowledge,—the mastery of nature by human intelligence,—may therefore truly be said to be indicated by both individualisation and generalisation alike.

* Facts illustrative of these statements will be found in Tylor's *Primitive Culture*, Chap. vii.; Lubbock's *Prehistoric Times*, pp. 437-9, and 562-3; H. Spencer's *Principles of Sociology*, Part i., Chap. vii., § 43.

§ 3.—*Denomination.*

The process of generalisation is incomplete till the class, which has been formed by thought, receives a name. Now, since nature becomes intelligible only in proportion as its manifold phenomena are grouped into classes, it is evident that intelligence implies the formation of general terms. Consequently general terms are found in all languages, being in fact essential to the very possibility of human speech; and their origin, like that of language, dates of course from prehistoric times. The function of such terms in human thought must therefore be explained in order to the complete exposition of the process of generalisation.

But this function has formed the subject of an important controversy, which is not yet altogether settled. The history of this controversy might, indeed, be regarded in some measure as the history of philosophy itself; and consequently it would be out of place to attempt even a sketch of it here. It is especially unnecessary to enter upon any account of mediæval Realism, which involves a problem in ontology rather than in psychology. We may, therefore, confine our attention to the more modern controversy between Conceptualism and Nominalism, which does possess a psychological interest. The two rival theories may be briefly described as holding,—the former that we can, the latter that we cannot, frame some idea corresponding in generality to any class of things that we name. To a careful reflection it must be evident that, even if the whole controversy cannot be set aside as a mere dispute about words, yet it is in a large measure stripped of any meaning when the terms involved are accurately employed. For

1. On the one hand, it must evidently be conceded to

the Conceptualist, that thought has a certain generality of reference, however that may be explained. We can think, judge, reason about classes of things,—about men, animals, vegetables, triangles, circles, and so forth,—with the clear consciousness that our thoughts, judgments, reasonings, hold good with regard to the whole of each class. On any other supposition science, and ordinary thinking itself, would be impossible; and the language of Nominalists, when fairly considered, never amounts to a denial of this.

2. On the other hand, it must with equal certainty be conceded to the Nominalist, that we cannot form a mental image of a class, that is, an image combining all the contradictory attributes by which the different individuals of the class are distinguished from each other. Whenever the doctrine of Conceptualism seems to maintain this, the very statement of it becomes its adequate refutation. Take, for example, the well-known passage of Locke's *Essay Concerning Human Understanding*:*—"Does it not require some pains and skill to form the general idea of a triangle (which is yet none of the most abstract, comprehensive, or difficult); for it must be neither oblique, nor rectangle, neither equilateral, equicrural, nor scalenon; but all and none of these at once. In effect, it is something imperfect that cannot exist; an idea, wherein some parts of several different and inconsistent ideas are put together." This has not unfairly been regarded as a *reductio ad absurdum*.

Consequently, when thought refers to a class, as when it refers to an individual, the mental image before our consciousness is that of an actual or possible individual,

* Book iv., Chap. vii., § 9.

or, if the process of thought is prolonged, there may be a series of changing images representing many distinct varieties in the class. If the mental image before our consciousness were taken to represent merely an individual, then its individual peculiarities would form the chief object of attention; but these peculiarities are abstracted from as much as possible, when the image is made to represent a whole class. In accordance with the principles explained in the first section of this chapter, the attention is then concentrated on the general features of the individual imaged,—on those features which that individual possesses in common with other individuals of the class. Accordingly, we know that our reasonings hold good with regard to that individual simply because it possesses the features of the whole class, and therefore that they hold good also of all individuals possessing the same general features. The function of the mental image implied in all general reasonings is precisely analogous to that of the diagram commonly used in geometrical demonstrations. The diagram must be a single figure with something to distinguish it from all others. If of a triangle, for example, it must be large or small, equilateral, isosceles, or scalene, right-angled, obtuse-angled, or acute-angled, and it must be made of some particular sort of stuff. But in a demonstration we can think of it as a triangle without reference to any of its individual peculiarities; and we can therefore feel assured that our demonstration applies equally to any other triangle as such.

We are now in a position to explain more definitely the part which general terms play in the process of generalisation. That part is twofold. The general term assists us in keeping before the mind the class-properties of individuals to the exclusion of their distinctive pecu-

liarities ; and it enables us also to retain a classification, once formed, as a permanent possession of the mind.

1. The general name is usually given to a number of objects, because it is significant of some property which they all possess ; and, consequently, it is calculated to suggest that property alone to the mind. A general name, therefore, becomes a sort of symbol for all objects possessing the property which it signifies ; and our general reasonings accordingly approach, if they do not actually attain, the nature of symbolical reasoning. The reasoning that is called symbolical is typified in the sciences of arithmetic and algebra. In arithmetic, by means of symbols, we carry on reasonings about abstract numbers, that is, about numbers without reference to the things that are numbered ; while in algebra, by a similar instrumentality, we can reason about number in the abstract without reference to any particular numbers. Our general reasonings may never reach this absolutely symbolical character ; but general terms enable us to dispense with the continued reference in consciousness to the actual individuals they signify, in the same way, if not in the same degree, as arithmetical figures and algebraical signs form an instrument for working out numerical calculations that are quite independent on the peculiar nature of the things that may be numbered.

2. But there is another function for general terms. We have analysed the process by which the cognition of a class is formed ; but after the class is thus cognised, how is it to be recognised ? The individual, as a natural combination, is perpetually presented in the course of nature, and requires, therefore, no other means of recognition, though the recognition even of the individual is facilitated by the expedient of proper names. But the class has no natural existence like that of the individual,

and therefore is not obtruded on consciousness again and again in the mere order of natural events. How, then, does it become a permanent acquisition for the mind? By means of general terms. The general term, we have seen, is significant of the common property belonging to a number of individuals, and preserves for us, therefore, the fact that these individuals have been grouped into one class on the ground of their all possessing that common property. The process of classification has often been compared to the action of the merchant who counts a confused heap of coins by grouping them in piles of a definite number. The comparison might be extended by observing that, as the continuance of the piles implies the law of gravitation, without which they would all be scattered as soon as formed, so the permanent classification of phenomena implies the faculty of naming, else the phenomena would return to their uncomprehended multiplicity, as soon as they were arranged into classes.

It has been questioned, whether any generalisation would be possible without the assistance of general names. The question is perhaps futile, as all normal human intelligence is developed by means of language, and we have no opportunity of knowing what might be possible to a being, could such be conceived, who was endowed with a normal human mind, and yet incapable of language,—of any system of signs. But the close dependence of generalisation on the faculty of speech is indicated by the fact, that deaf mutes find a difficulty in abstracting, and therefore in grasping the signification of common nouns.*

* Dr. Howe, in the Eighth Annual Report of the Massachusetts Asylum, quoted in Mrs. Lamson's *Life and Education of Laura*

This analysis shows that our general reasonings are exposed to a two-fold danger,—one arising from their symbolical nature, the other from the fact that the mental image which represents a class is necessarily the image of an individual.

1. The fact, that general terms become to our thought symbols of a whole class of objects, implies that the meaning they suggest cannot be perpetually corrected by examining all the individuals of the class. Now, however closely such a term may be defined, it remains capable of suggesting more or other meanings than that to which it is limited by definition; and though we may set out with the defined signification, this is apt to be lost sight of in the course of a long process of reasoning. This danger is to a considerable extent avoided by the coinage of a purely scientific nomenclature; but in many departments of thought, especially in the mental and moral and political sciences, we are still largely exposed to all the vague and vacillating suggestions of ordinary language. In the history of psychology an interesting chapter might be written on the influence which has been exerted by the figurative implications of such terms as impression, affection, representation, image, idea.

2. In general reasonings the image of an individual stands before the consciousness as a sort of mental diagram to represent its class. We may begin a process of reasoning with the exclusion of all features of the individual image except those which are common to the class; yet in course of the process we often find the

Bridgman, p. 16. Laura Bridgman herself used general adjectives at first as proper names, that is, as names of the individual objects to which they were applied (*Ibid.*, p. 40). Compare Tylor's *Introduction to Anthropology*, p. 119.

imagination lording it over thought, and are pulled up by some opponent objecting another individual or other individuals, to which our reasonings do not apply. This is a vice which perpetually besets the scientific inquirer, who is not on his guard against the temptation to leap at conclusions after an inadequate induction of particular facts. It is in all minds the source of much of the power which custom wields over our thoughts, leading us to ascribe the characteristics of the objects with which we are familiar to all objects of the same class, however different their circumstances may be. This tendency is, therefore, the peculiar defect of what we might, in the largest sense, call the untravelled mind.

CHAPTER III.

REASONING.

REASONING is often described as the procedure of consciousness from individuals to the class which they form (Induction), or from a class to an individual or individuals that it includes (Deduction). It is, therefore, rather a *process*, more or less lengthy, by which an object is comprehended, than an *act* of immediate intuition, by which an object is apprehended. It follows from this, that reasoning cannot always be precisely distinguished either from perception or from generalisation, just as these cannot be precisely distinguished from one another. Every perception, as implying a cognition of the class-attributes of the object perceived, involves a reasoning, commonly of the deductive sort ; while generalisation is obviously the result of some mode of inductive reasoning however vague. But in the mental phenomena, which we commonly speak of as perceptions and generalisations, the reasoning process becomes unconscious, being absorbed in its products. It may therefore be studied to more advantage in those conscious efforts of intelligence to which the name of reasoning is, in a stricter sense, confined. But it must not be supposed that, in actual mental life, conscious and unconscious reasonings can be always distinguished with exactness. In the daily consciousness

of every man there are numerous acts which it would be difficult to refer exclusively to either class.

In analysing the process of reasoning, it is important to keep in view the distinction between the psychology of the reasoning process and the science of logic. Psychology, as the science of mental facts, details the steps which reasoning follows in actual life with all its comic and tragic inaccuracies. Logic, on the other hand, belongs to that class of sciences which, as dealing with laws that must be observed in order to the attainment of a certain end, have been appropriately styled by the general title of *nomology*. Every sphere of our mental life, in fact, may have a nomology of its own according to the end which it is designed to subserve. Thus we point an end to our sensitive life in such studies as those of gastronomy, perfumery, music, the theory of colours; while the higher activities find their norm in mechanics, æsthetics, ethics, politics. In the same way, then, as the psychology of the moral life is distinguished from ethics, or the psychology of calculation from arithmetic, the psychology of reasoning ought to be kept apart from logic.*

Actual, as distinguished from logical, reasoning is manifold. It commences, perhaps, with the movement from particulars to particulars, if this be not mere unreflective association, and then develops into the reflective, or at least more reflective, movements from the particular to the general, from the general to the

* Sometimes, it may be further observed, psychology, and logic also, are confounded with philosophy, as in the discussion by psychologists and logicians of the question regarding "the ultimate postulate," "the fundamental axiom," which, in the last analysis, forms the criterion or warrant of all thinking, of all science.

particular. To determine the warrant for such inferences, is the function of logic; but the theory of the fallacies, which always forms a prominent part of that science, shows how the actual movements of thought are often regardless of logical warrant.

There are three factors of the reasoning process, which have been usually distinguished by psychologists and logicians. The first is the object reasoned about; the second, the predication, to which the reasoning process leads, in reference to that object; the third, the process itself, by which the predication is established. We shall take these factors in separate sections.

§ 1.—*Conception.*

The mental act, by which an object of thought is formed, was commonly named, in the old logical textbooks, *simple apprehension*; but by many logicians it is more appropriately called *conception*. The word conception, like *comprehension*, signifies literally *grasping together*, and is therefore an appropriate name for any kind of knowledge which is obtained by gathering many into one. Such an act of knowledge may be accomplished either by mentally grouping into one class a number of different individuals on the ground of their possessing some common property or properties, or by associating a number of different properties on the ground of their belonging in common to the same individual or the same class.

The object of consciousness in a conception,—that which is conceived,—is called, in the technical language of logic, a *concept*; and the word or combination of words, expressing a concept, is called a *term*.

From this it will be seen that a term, as expressing a

concept, may be viewed in various aspects. For a concept, as just explained, is either a combination of individuals forming a class, or a combination of properties belonging to an individual or to a class. The former combination constitutes what is called the *extension* of a concept or of the term expressing it; the latter combination is called *intension*. Consequently a term may be, and in thought actually is at different times, interpreted in reference to both of these aspects. Thus the term *man*, to different minds, or even to the same mind at different times, may mean either the individuals who compose the human race, or the attributes that constitute human nature. It has also been made a subject of discussion, whether terms are the names of things, or merely of our ideas of things.*

In all such discussions confusion is apt to arise from failure to distinguish the logical and the psychological aspects of the question at issue. The logician, dealing with the laws which must be observed for the sake of accurate thinking, may select one aspect of terms as that which is most suitable for the end he has in view. But his selection does not foreclose the cognate psychological question: it does not imply that the aspect selected is the only possible aspect in which terms may be interpreted, or even that it is the most common interpretation put upon terms in the confused and blundering thoughts that make up the daily mental life of men. On the contrary, whatever interpretation of terms may be considered most convenient for logical thinking, it remains a fact, which the psychologist cannot ignore, that the aspect in which a term is viewed, may vary with the attitude of the mind.

* Mill's *Logic*, Book i., Chap. ii., § 2.

Mr. Mill holds that terms properly denote things rather than merely our ideas of things;* and with certain explanations his theory is correct; for thought would fail in its function, if it did not take us beyond its own subjective operations, if it did not construe for us an objective world of things. But the explanations, which ought to accompany this statement, take us into the sphere of ontology. Mill is led into the ontological question which his statement suggests; and it is worth noting that his statement is nearly eviscerated of its meaning by his doctrine as to what constitutes a thing.†

All our concepts, whether they represent perceptions of individuals, or generalisations, imply, as we have already seen, reasonings more or less unconscious. Our intellectual life begins with unreflective reasonings, and the concepts thus reached form the starting-point of more reflective reasonings, by which the obscure and uncertain and limited results of unreflective reasoning are developed and confirmed and extended.

§ 2.—*Judgment.*

An object of thought—a concept—is usually, as we have seen, a combination of attributes. But, of course, all the attributes of an object are not within the knowledge of every intelligence; and even when they have become familiar to any intelligence, are not always present to his consciousness. He may have learnt, for example, all the properties by which a particular species of animals, vegetables, or minerals is characterised; but

* Mill's *Logic*, Book i., Chap. ii., § 2.

† *Ibid.*, Book i., Chap. iii., §§ 13-15.

in his ordinary thoughts these properties are seldom all consciously recalled. Take, by way of illustration, any plant with its peculiar corolla, calyx, and leaf, the number of its petals, sepals, pistils, and stamens, as well as other facts in reference to its organisation, its growth, or its geographical distribution. Even the simpler constitution of a mineral does not exclude a multiplicity of properties, geometrical, physical, and chemical, not to speak of its adventitious æsthetic or commercial uses. Thus gold is distinguishable from other minerals by no less than eight different properties. Then, when we come to the more complicated concepts of biology and psychology, of ethics and politics,—life, thought, beauty, conscience, right, and many others of a similar nature,—we find not only that our concepts usually exhibit a very incomplete grasp of all the factors implied, but a very indefinite apprehension even of those which are conceived.

Our concepts are, therefore, ordinarily of a somewhat indefinite character. Now, when an ordinary indefinite concept becomes defined by attributing to it some quality, our thought assumes the form that is technically called a *judgment*, the indefinite concept being the *subject*, and the defining quality the *predicate*. When, for example, to the indefinite concept of gold as a yellow metal I add the predicate, that it is the most malleable of all metals, or that it is fusible in a mixture of nitric and hydrochloric acids, I form a judgment about the subject *gold*. It is scarcely necessary, therefore, to add that judgments cannot by a rigid line be separated from concepts: the judgment is in fact simply the concept unfolding itself to clearer definition.

Of judgments some are formed by simply evolving the meaning involved in the subject. Thus, when I

say, *A quadruped is a four-footed animal*, the predicate of four-footedness merely unfolds the idea implied in the subject. Such judgments have accordingly been called *analytic, explicative, verbal, essential*. On the other hand, judgments, which add to the idea implied in the subject, are called *synthetic, ampliative, real, accidental*.*

Explicative judgments are dismissed by some writers as useless fictions.† But this extreme depreciation of such judgments overlooks their real nature. To most minds the ordinary subjects of thought are indefinite concepts which require explication; and such explication is rendered all the more necessary from the fact that most of the terms in common use have wandered so far from their primitive meaning, that their etymology no longer reveals their full connotation. Still this very fact implies that the distinction between analytic and synthetic judgments is one that cannot always be carried out. For when the etymology of a term does not reveal its connotation, any factor of the connotation may constitute a synthetic judgment; and, on the other hand, when a scientific thinker has mastered the complete connotation of a subject, it might be said that for him every judgment about it must be merely analytic. It some-

* Some writers, like Thomson (*Outline of the Laws of Thought*, § 81), distinguish, as a separate class, *tautologous* judgments, in which a term is simply predicated of itself, as in *Facts are facts, A man's a man*. By writers of the school of Locke such judgments are described by the name *identical*, and are commonly dismissed as frivolous. See Locke's *Essay*, Part iv., Chap. viii., §§ 2-3. Thomson, indeed, recognises the fact that such judgments may become charged with meaning by some particular emphasis. But he is mistaken in regarding that as accidental to them; it is rather their essential and ordinary use.

† Locke's *Essay on the Human Understanding*, Part iv., Chap. viii., §§ 4-10; Mill's *System of Logic*, Book i., Chap. vi.

times happens, however, that a concept, in its general attributes perfectly definite, receives some particular qualification, as when a well-known mineral or vegetable is said to be applied to certain adventitious uses, or when an accidental action or state is ascribed to any person.

From this it appears that subjects admit of various sorts of predicates. The classification of these is the object of the logical doctrine of predicable, the term *predicable* being employed for any word that is capable of being used as a predicate. This doctrine is of special interest to the logician for the sake of that accuracy in thinking at which he aims; for to attain that end it is indispensable to know precisely the relation of the predicate to the subject of a judgment. But the classification of predicable is not of the same importance to the psychologist. Connected with this subject, however, there is a general question which does possess psychological interest,—the question, namely, as to the import of a judgment or proposition. In the preceding section it was shown that a similar question is discussed in reference to the import of terms; and it was there explained that a term may be interpreted from different points of view. The same points of view also affect the import attached to propositions. For example, we may consider mainly either the extension or the intension of a predicate, and this difference will alter the mode in which we interpret its relation to the subject. In fact, an alteration in the form of expression will often give prominence to the one of these views over the other. Thus, if I say, *The ornithorynchus is a quadruped*, I naturally think of this animal as belonging to the class of quadrupeds, that is to say, I interpret the proposition as meaning that the subject is included within the extension of the predicate. When I vary the expression into

The ornithorynchus is four footed, I think rather of four-footedness as forming one of the attributes of the animal, that is, the predicate is conceived as being included in the intension of the subject.

In consequence of the various aspects in which it thus appears that a proposition may be viewed, a good deal of controversy has been excited regarding the real import of propositions. Mr. Mill devotes considerable space to the criticism of various theories on this subject.* He opposes the doctrines, that a proposition expresses a relation between two ideas, or between the meanings of two terms, or that it refers something to, or excludes something from, a class; and, in accordance with his theory of the import of terms, he holds that a proposition is to be interpreted as meaning that the things denoted by the subject possess the attributes connoted by the predicate.

Now, in all such discussions, as in the similar discussions with reference to the import of terms, considerable confusion arises from allowing the inquiry of the logician to run into the field of psychology. The problem of logic is to find out what is the aspect in which a proposition should be treated with the view of securing the greatest accuracy of thought in its use. But the import attached to propositions for logical purposes is not necessarily supposed to be that of which alone they admit, or even to be the interpretation most commonly put upon them in the confused thinking of ordinary mental life.

§ 3.—Reasoning Proper.

When a judgment is analytic, it must be evident to every one who understands its terms, its evidence is con-

* *System of Logic*, Book i., Chap. v.

tained in its own terms, in itself ; it is, therefore, called *self-evident*. Whether any synthetic judgments also are self-evident, is a question that need not be discussed here. It is admitted that a vast proportion of our judgments do not contain their evidence in themselves : their evidence must, therefore, be sought outside.

Now, a judgment is a relation of two concepts,—of two things conceived ; and when that relation is in itself unknown, it must be reached from some other relation that is known. The process, by which this is reached, is called *reasoning* or *inference*, in the stricter sense of these terms. It is this process that is now to be analysed. In order to this analysis it is to be observed, that the process implies (1) an unknown relation, (2) a relation that is known, (3) a transition from the latter to the former relation. Now, such a transition of thought must consist in the conscious comparison of the two relations. The analysis may be rendered clearer by a few expository observations.

I. Reasoning is thus seen to be, in its essential nature, merely the universal process of intelligence,—comparison, with association of course implied. Objects,—materials,—therefore, form fit data for reasoning, in proportion to their fitness for the uses of intelligence in general,—in proportion to their comparability, that is, the ease with which their relations are discoverable. Now, no relations are so obvious, so distinctly apprehensible, so *measurable*, as those relations of mutual externality which constitute space ; and, therefore, geometry was the earliest science to attain exactness of reasoning. Based on the concept of space is the concept of quantity in general ; and the relations of quantities are among the most easily comparable. Accordingly not only have the sciences of abstract quantity,—arithmetic and

algebra,—long ago attained exactness, but other sciences become exact precisely in so far as their reasonings take the form of quantitative calculations.

II. Since it thus appears that reasoning is essentially identical with the universal process of intelligence, it must have a certain affinity with those other forms of intelligence, the ordinary perceptions and generalisations, which have been analysed in the immediately preceding chapters. Still there is of course also a certain difference between either of these forms of intelligence and reasoning. That difference consists in the fact, that reasoning is a more complicated comparison. The superior complication of reasoning may be expressed by saying, that it is not, like judgment, a comparison of concepts, but a comparison of judgments. This analysis of reasoning has perhaps never been more clearly expounded than by Mr. Herbert Spencer, who describes the process as a comparison, not of terms, but of relations.* Of course this description is not sufficient always to distinguish reasoning from judgment, or even from conception; for these are often the results of reasoning. Still, reflective reasoning implies previous concepts and judgments, even if, as when they are general, they have been formed by previous reasonings, reflective or unreflective.

From this it follows that the account of the reasoning process given by logicians cannot be taken as a psychological analysis. In the common textbooks on logic, reasoning is described as a comparison of two terms with a third in order to their comparison with one another.

* *Principles of Psychology*, Part vi., Chapters 2—8. The doctrine is perhaps foreshadowed by Hobbes. See, besides his *Computation*, the *Leviathan*, p. 30 (Molesworth's edition).

Now, for logical purposes such a description may be convenient and useful. That is a question which the psychologist need not discuss. But no psychological analysis would completely exhibit the nature of reasoning, which did not point out that it implies a comparison of two relations or judgments. Then the premisses are to be regarded as representing the two relations, and the conclusion in reality expresses their relation or comparison. To illustrate, let us exhibit the syllogism under the form which it would take from this analysis. Let P = major term, S = minor term, and M = middle term. Then the following formula would represent a syllogism in the first figure :—

$$\begin{aligned} M &\text{ is } P, \\ S &\text{ is } M, \\ \therefore S &\text{ is } P. \end{aligned}$$

This, according to the above analysis, would run into the more complete formula :—

$$S : M :: M : P;$$

and that, of course, is equivalent to

$$S : M = M : P.$$

If the syllogism were negative, as

$$\begin{aligned} M &\text{ is not } P, \\ S &\text{ is } M, \\ \therefore S &\text{ is not } P, \end{aligned}$$

then the relation of S : M would be represented as unequal to the relation of M : P.

This will perhaps be clearer in the case of quantitative reasonings. Take, therefore, a very simple algebraical process :—

$$\begin{aligned}
 4x + 2 &= 3x + 4 & (1) \\
 \therefore 4x - 3x &= 4 - 2 & (2) \\
 \therefore x &= 2 & (3)
 \end{aligned}$$

Here it is evident that the operation is a procedure in thought from (1) to (2), and from (2) to (3). Each of these three stages in the procedure, however, is an equation, that is, a relation or judgment of equality; and the procedure from one to another involves the comparison of each with that to which it leads. The reasoning, therefore, in this instance, if fully expressed, would run thus:—

$$(4x + 2) : (3x + 4) :: (4x - 3x) : (4 - 2),$$

and

$$(4x - 3x) : (4 - 2) :: x : 2.$$

This simple operation may be taken as a type of quantitative reasonings in general, for the most elaborate calculations are simply a lengthening out of the same process. It appears, therefore, that all quantitative reasonings, in applied as well as in pure mathematics, involve a similar comparison of equations more or less numerous. But quantitative reasonings differ from others only in the fact, that they exhibit the reasoning process with the great advantage of absolutely exact terms; and, consequently, all reasoning is analysed into a comparison, not of terms merely, but of judgments.

III. All the varieties of the reasoning process are usually regarded as modifications of two fundamental types,—one proceeding from the general to the particular, and called Deduction; the other, from the particular to the general, and called Induction. But some recent writers, following Mr. Mill,* recognise an inference from

* *System of Logic*, Book ii., Chap. iii., § 3.

particulars to particulars, maintaining even at times, that all reasoning is of this nature. Now, there can be no doubt of the fact, that a procedure of this sort does occur in consciousness. It may even be admitted that it is probably more common than a definite ascent to the general, or a definite descent to the particular. Take, for illustration, one of Mr. Mill's own examples, the reasoning implied in the proverb, that "a burnt child dreads the fire." It is well known that one or two experiences are sufficient to associate in a child's mind the appearance of a fire with the painful sensation of burning, and that any subsequent sight of the fire will probably suggest the thought that the touch of the fire will be followed by the former pain. Any of the more intelligent among the lower animals can go through this process.

The actuality of such a mental process, then, is not a matter of doubt. The only question is as to the propriety of calling it *reasoning*. It may appear at first as if this were merely a question of words; but, as in many similar cases, a failure to distinguish by different terms phenomena that have only a superficial resemblance may lead to serious confusion of thought. Here there is an essential difference between the mental processes that would be included under one term. In one process a fact is simply *suggested* by another fact in accordance with the unconsciously operating laws of association; in the other process a fact is *thought* as founded on a certain reason. The latter is appropriately called reasoning, because it is the consciousness of a reason. Whether the former,—the mere suggestion,—should also be called reasoning, may not be considered a question of prime importance; but it is certainly important to distinguish, in some unmistakable way, processes so essentially different as those described. Mr. Mill himself explains that, whenever the

reason of proceeding from particulars to particulars is sought, that reason is to be found in a general proposition with reference to the *whole* class of phenomena to which the particulars belong ; and it is more in accordance with the use of language, as well as more convenient for scientific purposes, to restrict the term *reasoning* to those transitions of consciousness, in which a reason for the transition is thought. Consequently, when any reasonings are spoken of as unreflective, this expression must be understood in a qualified sense. When any process which simulates reasoning, is absolutely unreflective,—when it is a simple transition of consciousness without any reflection on its reason,—it ought, in psychological analysis, to be degraded to a mere suggestion.

The common distinction between Deductive and Inductive Reasonings may, therefore, be retained, and more closely examined.

1. *Deduction* is not, as often represented, a mere *petitio principii*. It is that process of thought, in which the reason of a particular fact is found in a general fact, that is, in a whole class of facts in which the particular fact is contained. The mistake of representing this as a mere begging of the question has probably arisen from the supposition, that the general reason must be, or usually is, thought before the particular fact. This supposition itself may have its origin in the confusion between the artificial formulæ of logic and the natural processes of consciousness. Commonly at the present day logicians state the parts of a syllogism in the order of Major Premiss, Minor Premiss, Conclusion ; and for logical accuracy this may be a proper artifice. But even among logicians this order has not been always maintained ;*

* See Hamilton's *Lectures on Logic*, Appendix x.

and no philosophical logician holds that that is the order in which alone men can think, or in which alone they actually do think.

Deduction, then, is a real process of intelligence, even though its chronological procedure may usually be from particular fact to general reason. Its possibility and its actuality arise from the same cause as the possibility and actuality of judgments, namely, because we do not always think explicitly all that is implicitly involved in our thought. A deduction simply unfolds to consciousness what consciousness may not have previously realised as part of the extension or of the intension of a concept; and the deduction may often be of incalculable theoretical or practical importance. For, though it is common to make fun of the stock-example in logical text-books, "All men are mortal: Cæsar is a man; and therefore Cæsar is mortal," yet it is often a crisis of unutterable meaning in the mental life of a man, when he substitutes for the mere symbol *Cæsar*, father, mother, brother, sister, friend, and for the first time the thought flashes into consciousness, that one of these must die, since all men do.

2. *Induction* is properly that process in which the reason of a general proposition is thought to be the observations made in reference to the particulars which the proposition includes. In actual conscious life this process admits of numerous varieties in its stages; and the norm, by which it ought to be governed in order to guard against error, forms the subject of Inductive Logic.

Though Induction and Deduction are thus distinguished for scientific purposes, it is not to be supposed that they always, or even commonly, exist apart in actual thinking. Not only is the intermingling of the two processes evident to psychological observation, but the logi-

cian also recognises Deduction as playing an indispensable part in most of the processes by which general truths are established, even if the philosopher does not claim that every Induction is based on some primal Deduction.

CHAPTER IV.

IDEALISATION.

THE term, Idealisation, is here employed to designate the latest and fullest outgrowth of intellectual life, in which the earlier and simpler activities culminate. It is not, indeed, to be regarded as sharply separable from these in the actual operations of the mind, any more than these are always separable from one another. In the evolution of these activities the simpler forms of idealisation are perpetually anticipated; but it implies something which is not explicitly exercised in these, and represents, in its maturer developments, the highest reaches of intelligence. After attaining perceptions of the individual and conceptions of the general, after ratiocinative transitions from one to the other, intelligence learns to combine in one cognition both of these products of its activity; the individual becomes transfigured with a higher glory by being viewed as the exponent of general laws, while these lose their dead abstractness by being seen in the concrete particulars, in which alone they have any living reality.

The use of the term, idealisation, to express this activity of intelligence, may be explained by reference to its original meaning. Idealisation is literally, the formation of an ideal. Now, an ideal is an object

which receives its determinate character from an idea, as this term is understood in its earlier and higher signification.* But in this signification idea means the general concept which, in the Platonic philosophy especially, was supposed to constitute the real essence of every individual in a class.† An ideal is, therefore, an object which is thought as an embodiment, not of particular accidents, but of universal principles.

Accordingly, such an object implies the prior formation of the general concept which it embodies. The general concept is the end which the intelligence seeks to realise in determining the ideal object. But the object thus aimed at is various, and it varies in accordance with the various activities of intelligence, of which it is the end. These activities may be purely speculative, concerned merely in the exercise of intellect; or they may be æsthetic, concerned primarily with the feelings; or they may be ethical, concerned immediately with the direction of the will. Finally, there may be an activity of still larger scope, as embracing all these three, and aiming at an ideal which absorbs the ideals of all the others. This activity may be named religious. The ideal of the first activity is truth absolute, that is, an absolutely harmonious system of thought; of the second, it is beauty, that is, an absolutely harmonious gratification; of the third, it is goodness, that is, an absolutely harmonious object of volition. Of the supreme activity of the human spirit

* See Kant's *Kritik der reinen Vernunft*, pp. 419—422, ed. Hartenstein.

† On the history of the word *idea* the materials for an interesting sketch will be found in Sir W. Hamilton's edition of *Reid's Works*. Note G. Compare also Hamilton's *Discussions*, pp. 69—71.

the ideal is God, that is, a being who comprehends all goodness and beauty and truth.

This chapter naturally divides into four sections.

§ 1.—*The Speculative Ideal.*

As already stated, the ideal of all intellectual exertion is truth. But truth, as its etymology implies, is an activity of mind; it is what a mind *troweth*.^{*} We have seen, however, that all the intellectual activities hitherto analysed involve consciousness of relation. A perception, even in the simplest form, is a consciousness of resemblance between a past and a present sensation,—a recognition of a past sensation in the present. Generalisation is a consciousness of resemblance between different phenomena, which are on that ground thought under one category or class. And reasoning was shown to be a consciousness of resemblance between relations. All cognitions are thus reducible to a consciousness of relations, which increase in complexity with the development of intellectual life.

But every consciousness of relation is not cognition. To make it cognition, the relation must be not merely an accidental coexistence in an individual consciousness; it must be independent on the accidents of an individual's mental life; it must be valid for universal intelligence. In a word, it must be, not a subjective association, but an objective connection. Such a consciousness is truth, knowledge, science.

Accordingly, the endeavour after truth is an effort to

^{*} *Troweth, trowth, trouth, and troth* are old spellings of truth. Piers Plowman uses, on one occasion, even the seemingly paradoxical expression, "many a fals treathe," which is, of course, merely many a false trowing or opinion.

bring all our consciousnesses—all our throwings—not only into harmonious relation, but into such connection, that they shall all be thought as dependent on, necessitated by, each other. All scientific research sets out with the assumption, that every truth is in thinkable unison with every other; and scientific effort would be at once paralysed by the suspicion, that there is any factor of knowledge which, in the last analysis, may be a surd quantity, incapable of being brought into intelligible relation with the general system of thought. The labours of science, therefore, aim at discovering to consciousness this reciprocal connection of different truths; and the intellectual ideal is thus a system of thought, in which all cognitions, that is, all truths, all objective connections, are conceived as component factors of one self-consciousness. Such a system is absolute truth.

Here it would be out of place to sketch such a system, even in general outline. This is the work of philosophy, not of psychology. Our interest is limited to the mental process, by which such a system unfolds itself in consciousness; and it now appears that this process is merely an inevitable outgrowth of that conscious comparison, which constitutes intelligence universally.

§ 2.—*The Æsthetic Ideal.*

The æsthetic ideal is beauty, and this has been already described as an absolutely pure gratification. Now, our gratifications—our pleasures—as well as our pains, arise from the exercise of our various powers in accordance with a law which will be investigated in the next part of this book. It will thus appear that a pleasure, to be pure, that is, to be free from any alloy, must be disinterested; in other words, it must be dissociated from all

the interests of life, speculative and practical, higher and lower alike. The lower interests are associated most closely with the struggle for individual existence, the higher with the struggle for social existence. The lower are, therefore, what are commonly understood as selfish interests; the higher as unselfish, social, more.¹ The two may be briefly spoken of as egoism and altruism respectively. Æsthetic gratification, as pure or harmonious, must be free from any incongruity either of egoism or of altruism. The activities, on which it depends, as has often been pointed out since Schiller's time, are of the nature of *play*,* in which exertion has no end beyond itself, finding complete satisfaction in the pleasure which itself produces.

That aspect of the æsthetic consciousness, in which it is considered as a mere feeling of pleasure, relegates it to the next part; but it has another aspect too. In so far as it is a consciousness of an object qualified to give a pure gratification, it involves an intellectual factor, the quality of the object being what is understood by beauty. It is this intellectual side of the æsthetic consciousness that comes under consideration at present.

Intellectually this consciousness is often described as imagination. As this term seems to imply merely the unaltered representation of what has been formerly presented in consciousness, psychologists have been accustomed to give explicitness to their language by disting-

* See Schiller's *Briefe über die ästhetische Erziehung des Menschen*, especially the sixteenth letter. It is this suggestion of Schiller's that forms the germ of Mr. Herbert Spencer's account of æsthetic feeling (*Principles of Psychology*, Part viii., Chap. ix.), of which a detailed exposition is given in Mr. Grant Allen's volume on *Physiological Æsthetics*.

ishing such unaltered representation as *simple* or *reproductive* imagination, while the imagination, implied in æsthetic consciousness, is described with varying propriety as *productive, creative, poetic, plastic, artistic*. This form of idealisation will also be found, on analysis, to be merely a mode of the general processes of intelligence,—association and comparison.

1. The materials of productive imagination, when not supplied immediately by perception,—and then of course they imply the associations and comparisons of all perceptions,—are given by representations, that is, by simple imaginations, suggested by the laws of association.

2. But there is more implied than the unmodified reproduction of former cognitions, and it is this additional factor of imagination that is intended to be expressed by such terms as *productive* and *creative*. It is true that, in one respect, the mind cannot be said to create or produce anything, as it cannot give existence to any materials which it has not originally received from sense; and for this reason the term *plastic* has been suggested as more descriptive of its operation.* But by rearranging the materials once given to it, imagination does create for these a new form; and in this sense the artistic mind may be truly spoken of as *creative*: it is this power of originating arrangements, which to itself are new, that constitutes the originality of any mind. This creative process must now be analysed.

Under analysis this process discloses so many forms, more or less complex, of that fundamental function of intelligence, which has been so often referred to already as comparison. This function is involved, not only in

* Sir W. Hamilton's *Lectures on Metaphysics*, Vol. ii., pp. 262, 498, 500.

those identifications and discriminations which the original materials of imagination imply, but in a peculiar and distinctive mode. The original materials are composite wholes, which must be decomposed into parts, in order that these may be recombined into new wholes. But this decomposition is simply one of the functions of comparison or thought ; it is the separation or discrimination of parts from one another. In like manner the recombination of the parts into a new whole is a further function of comparison ; it is the identification of corresponding parts of different wholes. This may be illustrated by taking one of the less complex operations of imagination, such as the creation of one of the simpler forms of fabulous animals. What, for example, is implied in the imagination of a centaur? First of all, there are, to start with, two original wholes—the human figure and that of a horse. The two figures are, in thought, separated into parts. The upper part—the bust—of man is conceived as having a certain analogy with the upper part—the head and neck—of the horse ; while the respective lower parts are likewise conceived as analogous. The parts of one figure are thus made alternately to supplant, and to be supplanted by, corresponding parts of the other ; and by this comparison there is created for thought a new imaginary form of animal.

While this simple creation illustrates the nature of the process implied in all artistic productions, it must not be supposed that they are all so easily analysed. On the contrary, many of these are so complex as to elude the most subtle analysis. This may be evinced more clearly by observing that the wholes analysed in the work of imagination are of two kinds, which may be distinguished as quantitative and qualitative.

1. A *quantitative* whole, which was variously named,

by older writers, *integral* or *mathematical*, is one whose parts exist out of each other in space, and are therefore really separable. The treatment of such wholes by the imagination has just been illustrated in the fiction of fabulous animals. Even in higher efforts a similar analysis and synthesis sometimes find scope. The sculptor or painter of an ideal will naturally study the peculiarities of figure in the objects most celebrated for the particular type of beauty which he wishes to produce; and the features of his new creation may be suggestions gathered from a great variety of such objects. This appears in the fact, that the ideal of every age and country receives its distinctive character from the realities with which the artist must have been most familiar.

2. But the more complicated productions of imagination imply also, and more generally, the analysis and synthesis of *qualitative* wholes. These have been sometimes called *physical* or *essential*. Their parts are qualities which, as not existing outside of each other in space, are separable only in idea, not in reality. Thus colour and figure, as attributes of the human body, are parts of a qualitative whole; and so are thought, feeling, desire, virtue, vice, as attributes of the human soul.* It is evident that all art, in so far as it gives expression to the spiritual life, must deal with this kind of whole.

The play of intelligence in producing its own ideal world is thus found to be that analysis and synthesis—that discrimination and identification—which we have found to be the function of intelligence that excites the æsthetic emotions; and the attribute of beauty, with

* On this distinction of wholes see Sir W. Hamilton's *Lectures on Metaphysics*, Vol. ii., pp. 339-40, with the authorities cited.

which it clothes its objects, has been therefore not untruly described as unity in variety. This description, indeed, is one of those abstractions which are far too general to be of much service in definition. It implies merely that any particular object of beauty, or the universe conceived as beautiful, must exhibit, amid all its variety, that unity, in virtue of which alone it is intelligible—in virtue of which alone, in fact, it is an object at all. Still some importance may be claimed, even for this very general implication. It brings the æsthetic ideal into harmony with the speculative. It shows that the beauty of anything has a certain affinity with its truth—that permanent æsthetic gratification must be derived, not from the transient fancies which particular men entertain about things, but from that insight into the real nature which things disclose to universal intelligence.

The direction, which the æsthetic play of intelligence takes, is determined by circumstances which can be discovered only by an investigation of particular cases; and such investigation must be left for the biographers of artists and the historians of art. The various products of æsthetic intelligence are spoken of as the *fine arts* in contradistinction from those in which utility is the ideal, and which are described as mechanical. But it has often been remarked that the two ideals are frequently combined, and that a more intense æsthetic satisfaction results from the consciousness that the beauty of an object is due to the same arrangement which gives it utility. This combination can be easily explained. For utility is the adaptation of means to an end. It is, therefore, an extremely definite form of that unity in variety, which we have seen to be characteristic of beauty.

It is common to distinguish the fine arts in accord-

ance with the materials they employ, or—what amounts to the same—the faculties which they address. This principle divides them into three classes. For all the arts either use the two most intellectual senses which have been sometimes inaccurately spoken of as the sole sensible organs of beauty, or they address themselves directly to the imagination through the ordinary medium of language.

I. The arts, which address themselves to the eye, are three,—sculpture, architecture, and painting. From the nature of vision these arts are subject to a peculiar restriction; they are limited to the situation of a moment. All motion, all change, all that is unfolded through time, is excluded from the immediate scope of these arts; they can tell of any event which occupies time merely what is capable of being apprehended in the arrangement of circumstances at a particular instant. This limitation, of course, imposes a peculiar difficulty on the artist: it requires him to select from the evolution of any phenomenon that moment, at which its whole meaning will be most completely suggested to the spectator. What moment best fulfils this condition,—the opening, the middle, or the close of a development,—is a problem of technical interest, which need not be discussed here. But the task affords the artist an opportunity of working one of the most potent charms within the reach of human skill. He can snatch from the ceaseless currents of time any moment of peculiar significance, and preserve something of its living power for the perennial enjoyment of human sight. It is but with sober truth, therefore, that Wordsworth exalts the function of the painter:—

“Thou, with ambition modest yet sublime,
Here, for the sight of mortal man, hast given

To one brief moment caught from fleeting time
The appropriate calm of blest eternity."*

There is probably, moreover, in every product of time some moment, which is more amply suggestive than any other, at least for the particular purpose of the artist; and an additional significance is given to his craft, when he frees that moment from its natural mutability, and imparts to it an ideal permanence. Although, therefore, it may be with a little youthful extravagance, it is not without an important meaning, that Schelling, in one of his earlier writings, observes:—"Every product of nature has only one moment of true perfect beauty, one moment of full existence. In this moment it is what it is for all eternity; beyond this there comes to it only a growth and a decay. Inasmuch as art presents the essence of the thing in that moment, it lifts it beyond time; it makes it appear in its pure being, in the eternal form of its life."†

1. Of the three arts included under this head the most limited in its range is *sculpture*; for it gives up the infinitely varied effect of colour, which is one of the chief sources of the painter's power, as well as the aid which he obtains from a background as a setting to his figures. The sculptor is limited to mere form for the expression of his conceptions. But it is the human form that he employs, and this includes muscular development and attitude. These, however, are ordinary natural expressions, and often the most pathetic expressions of human

* *Miscellaneous Sonnets*, ix.

† *Ueber das Verhältniss der bildenden Künste zu der Natur* (Werke, Erste Abtheilung, Vol. vii., p. 303). A good story in point is told of Wordsworth. Being asked, on one occasion, whether he had not written some verses on a daisy, he replied, with some warmth, "No, it was on *the* daisy,—a very different thing!"

emotion; so that the range of the sculptor's power is larger, and its intensity deeper, than the limitation of his material might at first lead us to suppose.

2. *Architecture* is akin to sculpture in the material it employs, but perfectly distinct in the effect at which it aims. Leaving the definiteness of the human figure, founding its combinations rather on the forms of external nature, it is necessarily more vague in its effects on the mind, awakening more of sentiment than of clear conception. It is an often quoted saying, that architecture is "frozen music;" and its affinity with music in the preponderance of its emotional over its intellectual effects gives a certain significance to the expression. Architecture, therefore, takes rank with music among the arts which have served as handmaids to religion, fitted as it is by the mysterious vagueness of its effects to stimulate "the spirit that worketh in us with groanings which cannot be uttered." There is a kindred sublimity in the ideas associated with public order in any community, forming as it does a human type of the vaster order of the universe. Not inappropriately, therefore, has architecture been employed among all nations in the service of political welfare for the purpose of adding its imposing effects to the institutions of government.

3. There is a certain restriction attached to *painting* which does not belong to architecture or sculpture. Representing objects on a plane surface, it is limited to a single point of view. But this defect is more than counterbalanced by the superior advantages of the art. For while it is unrestricted in regard to the kind of figures with which it deals, its power is greatly enhanced by its being able to represent these in their native colours and in all the setting of the world by which they are surrounded in reality. By the variety of its figures,

therefore, by combining these with their actual surroundings, by exhibiting them in all the coloured light in which they would naturally be seen, painting is endowed with greater power than any other art to bring the visible world, in all its life-like reality, before the mind.

II. In *music*,—the art which addresses the ear,—time is involved as essentially as it is excluded in the arts which address the eye. The flow of sound is sometimes spoken of as an ideal movement, and a considerable part of musical gratification is due to rhythm or periodicity, that is, the separation of the whole time occupied by a musical composition into equal intervals. The general effect of music on the mind may well be described as mysterious, for it presents a problem which is very far from being satisfactorily solved. But as that effect is one that touches the feelings rather than the intellect, it will appropriately come up again for discussion at a later stage. It need only be said here, that tones constitute the material of the musical artist in the same sense as form and colour in the arts that address the eye, and that the musical ideal is a product of the same intellectual analysis and synthesis, which form the process of artistic production in general.

III. The art, which uses language as its material, may be named *literature*, for want of any more expressive designation. The term *poetry* might be appropriate, were it not so commonly used with exclusive reference to a versified structure of composition. For the aim of poetry is to produce an æsthetic gratification by the mere play of intellect and feeling stimulated by the suggestions of language. But literature in all its forms has some immediate end in view, narration or exposition, argument or exhortation ; and the more artistically it is constructed for the attainment of this end, the more nearly

does it approach the character of poetry from the æsthetic gratification with which the end is secured. Accordingly, the descriptive narratives in which the historian makes the past live again before his reader's imagination, the illustrations by which the scientific expositor enables us to see throughout the world the manifold operations of a vast natural law,—all such literary achievements are the source of an artistic pleasure. Even a well-connected mathematical demonstration, or a bare statement of scientific facts arranged into clear system, may possess some charm of art.

Literature is not, like the other arts, limited to the materials of a single sense. Addressing itself directly to the mind through the most familiar and most intelligible form of human expression, it claims for its use, not only the materials of all sensation, but every feeling and thought, every mental state and act, that is capable of being suggested by words. It cannot, indeed, reproduce the visual aspects of a remote object or a past scene with the vividness which may be given to these by painting or sculpture, nor can it stir the soul with the uncontrollable emotions which music excites; but its range is unrestricted by any of the limitations within which these arts are confined. It can even, by what has been somewhat significantly named word-painting, produce with some success a visual image of what is distant in space or time; and the pictures, thus conjured before the imagination, instead of being limited to an instantaneous situation, may range through any period, and be quickened with all the liveliness of movement, of change. It can also, by the euphonious combinations of language even in prose, and still more by the measured euphony of verse, produce a certain musical effect; while by making the tones of language ring to the march of

historical events, to an unfolding chain of argument, or to the illustration of an universal truth, it can enlist intellect in the work of emotion, and direct an emotional outburst to its aim with a certainty which is impossible under the vague impulses of music.

It is scarcely necessary to add that the artistic character of literary composition is due to that intellectual analysis and synthesis which are the source of all art. Even the simplest grammatical syntax, as the name indicates, implies an intelligent discrimination of the parts of speech and their combination into a sentence; while the term *composition*, which is commonly used, not only for the syntax of words in a sentence, but for the arrangement of sentences in the treatment of an extensive theme, points also to the nature of the intellectual operation which literary work involves. The experience of the literary man is often a painful illustration of the wearisome toil which must be undergone to collect his materials and marshal them in an order intelligible to himself before he can make it intelligible to his readers; while the wearisome toil, which unfortunately a reader must often undergo, is an equally painful illustration of failure, on the part of the literary workman, to master his materials by the detailed research and the intelligible combination necessary to artistic work.

The remarks in this section have been of necessity limited mainly to the æsthetic consciousness of men in general, without entering at length on the specialised consciousness of the artist. The importance of artistic production in human life, and the special character of the culture which it implies, have raised the subject into the rank of a special science. For the technical examination of the principles of art, the student must

consult any of the numerous works on æsthetics or on the several arts.

§ 3.—*The Ethical Ideal.*

The nature of volition is a subject reserved for discussion at a later stage. There it will appear that a volition is a self-conscious act,—an act of a being who knows what he is doing, knows the end which his act is designed to attain. It is not to be supposed that every phenomenon in human life, which is called action, answers to this description. Many so-called actions involve no conscious direction towards an end. Whether or not such phenomena can in strictness be called actions, they are not volitions; and therefore a volition is an intelligent act,—an act directed by intelligence of an end to be reached.

As the actions of men are various, various also are the ends which they seek to attain. But as the end is always one that is sought by an intelligent being, it must be in some sort adapted to his intelligence. His intelligence, however, can take cognizance, not merely of the end to be attained by any particular action, but also of the remoter consequences which are linked with that end by an indissoluble chain of causation. Consequently, every being, who is capable of intelligently directing his conduct, governs it not merely by purposes of the moment, but by reference to results of far larger scope. It is, in fact, scarcely possible to conceive an intelligent act which is exhausted in its immediate end. Is it the blow of a hammer, the thrust of a spade into the soil, a walk from one point to another, a child's exercise over the alphabet, or a statesman's address to a legislature? the meaning of all such acts is usually explained by results that are not to be reached for hours, for days, or, it may be, for years. The intelligent agent,

therefore, seeks a rule of conduct which is of permanent value, and not merely of ephemeral use.

But the intelligent rule of conduct is thus not only lengthened in its scope; it is also widened. For the actions of a man bring him into manifold reciprocity with his fellows; and consequently he finds that his conduct cannot but have a reference to others as well as to himself. This necessary reference to others inevitably expands, as does the necessary reference to his individual circumstances. As his intelligence cannot limit itself to the wants of the moment in seeking a rule for the guidance of his conduct, so it cannot restrict itself by a regard for a limited circle of other persons, to the disregard of all outside. The same imperious necessity, which demands of the intelligent being, that his conduct shall be intelligent, refuses to let him rest content with any rule which is of limited application to himself or to others. It is not in accordance with the claims of intelligence, it is not reasonable, that any one moment, or any one person, should alone be considered in acting. The intelligent agent, therefore, finds satisfaction only in a rule of conduct which is of universal application,—a rule giving him an aim for one moment which is not discordant with the aims of any other,—an aim for himself which does not conflict with the aims of other persons. This is that absolutely harmonious end,—that realisation of universal law in the particular act,—which constitutes the ethical ideal.

The preceding remarks are not, of course, to be taken as an exhaustive analysis of the ethical consciousness. This mental state always involves an element of feeling, which is not only often predominant, but even at times completely submerges the intellectual factor. The nature of the moral feelings will come under consideration

again ; but even the intellectual side of the moral consciousness must not be supposed to be exhausted in the above analysis. The analysis brings out one feature of the rule which the moral consciousness seeks for the guidance of action ; it shows that that rule is one of universal application. But this is a mere form, to which specific contents must be supplied. For we are not told what end is that which can be universally prescribed for human conduct. Is it pleasure or perfection, is it respect for self or respect for others, is it the will of the Infinite Being, or the laws of nature, or the conditions of success in the struggle for existence ? These are questions which need not be discussed here ; they carry us beyond psychology into the domain of ethics.

But, in addition, it must be observed that the above analysis brings out mainly the pure form of the moral consciousness,—the form towards which the evolution of that consciousness tends. The process of evolution, however, both in the individual and in communities, reveals many impure or imperfect forms in ordinary mental life. A great part of history is necessarily devoted to tracing the development of this consciousness towards its ideal universality, as well as the effect of such development on the institutions and customs of communities ; while general literature derives much of its interest and pathos from its pictures of the infinitely varied stages of moral culture, and of the tragic or comic results which these produce in human life. For as this consciousness is the authoritative controller of conduct, we have in it the most potent influence in giving a permanent character to the organisation of society. Accordingly, in our social institutions,—in the family, in the State, in international law, in the Church itself considered as a corporation of human beings,—we have so many realised expressions,

more or less perfect, of the moral consciousness. These institutions, however, are of such importance in human life, that they form the subjects of separate sciences ; and for further discussion of them the student must be referred to philosophical jurisprudence and politics.

§ 4.—*The Religious Ideal.*

The ideals, examined in the three preceding sections, all indicate the tendency of intelligence, as it develops, to seek the universal in the particular, to interpret the particular in the light of the universal. In its purely speculative activity the aim is simply to know,—*scimus ut sciamus*,—without reference to any ulterior end,—any application of the knowledge obtained ; and of this activity, as has been seen, the ultimate ideal is the harmony of each particular knowledge with universal intelligence, that is, its comprehension in one self-consciousness. In the practical activity of intelligence, as explained in last section, the aim is one ulterior to mere knowledge,—*scimus ut operemur*,—we make use of our knowledge as a rule of conduct ; and of this activity the ultimate ideal was shown to be the harmony of each particular rule with universal practical intelligence, or, in other words, the comprehension of all rules in one self-consciousness. Besides the speculative and practical activities of intelligence, the second section explained another activity, which has no interest of a speculative or of a practical kind in view, the ultimate end of which is, in short, nothing beyond the play of intelligence itself. The beauty, which is the ideal of this activity, implies the harmony of each particular object of

intellectual play with universal intelligence, that is, the comprehension of all in one self-consciousness.

These various forms of idealisation are thus found to harmonise in so far as they all imply in the individual intelligence a reference to an universal intelligence ; and every advance to a larger truth, to a fairer beauty, to a more perfect rule of life, is an evidence of the aspiration of the individual towards the standpoint of the universal mind. When this aspiration becomes an explicit fact of consciousness, it forms the religious spirit in man ; and its ideal is therefore that Universal Mind, in whom all the speculative and practical and æsthetic ideals of the human consciousness are realised.

This sketch is not, of course, given as a complete analysis of the religious consciousness, any more than the analysis in the preceding section was supposed to exhaust the contents of the moral consciousness. Like the moral consciousness, the religious consciousness also contains a large emotional element ; and the various forms of emotion, which enter into its structure, will be noticed at another time. In its historical evolution, moreover, the religious consciousness undergoes even stranger modifications than the moral consciousness ; and its influence upon the life of men,—on the recluse as well as on the man of the world, on commercial enterprise as well as on schools of thought, on social customs and political institutions,—has been among the most extensive and permanent of the forces, by which human history is moulded. For whatever may be decided, on more accurate inquiry, with regard to a few savage tribes, which are said to be without any form of religious belief, and though it is claimed for some speculative minds, that they are uninfluenced by religious ideas, yet no nation without religious institutions has ever taken a prominent

place in the world's history ; and there does not seem, therefore, to be any normal human development, which does not evolve some consciousness of the relation between the finite mind and the Infinite. The manifold influences of this consciousness must be traced either in works which treat of history in general, or in the special histories of religion. Here we deal with the religious consciousness merely as a fact in the mental life of men. The true interpretation of this fact, its validity as evidence of any objective reality, is a problem which takes us beyond the limits of psychology. In fact, the whole subject of the religious consciousness opens up a vast range of other than psychological questions, which are of such importance as to constitute a separate science, or rather the cyclopædia of separate sciences known under the name of *theology*.

CHAPTER V.

ILLUSORY COGNITIONS.

AN illusion, as the name implies, is a state of consciousness, in which, though apparently informed, one is not really so, but is rather *played with*, made sport of, befooled. It is true, the term is used by some writers in a more restricted sense, which will be noticed immediately; but the more general application continues to hold its ground, while it is more accordant with the etymology of the word. It will at least be found convenient to describe as illusory all those mental states, which simulate the appearance of knowledge without giving us real information. In discussing these phenomena we shall, first of all, make some remarks on their general nature and classification, then describe and explain some of the most familiar, such as dreams.

§ 1.—*Illusions in General.*

Illusory cognitions may be distinguished according to the sources from which they arise. These are three. Sometimes it is the senses that are at fault in creating the illusory impression. At other times the mistake originates in an intellectual process erroneously interpreting a normal impression of sense; while in a third class of cases the error lies wholly in an irregular intellectual

process. To the first of these mental states the name *hallucination* is often given by recent psychologists; the third comprehends the *fallacies* commonly described in logical text-books; while for the second the term *illusion* is sometimes specifically reserved. This distinction is one which cannot always be rigidly carried out. The hallucinations, arising from the abnormal activities of sense, merge imperceptibly at times into the illusions which imply a misinterpretation of sensuous impressions; and these again are often indistinguishable from fallacious processes of reasoning. The fallacies may be here left out of account, as they form a doctrine specially reserved for logic, and appropriately treated as a subsidiary illustration of logical rules. We shall endeavour to reach some outline of the phenomena comprehended under hallucinations and illusions, in the strictest sense of these terms.

(A) *Hallucinations* originate in the raw materials of knowledge, in the fact that the mind is furnished with erroneous data. They imply, therefore, some abnormal excitation of sense. Sensations of the same kind as those which are normally excited by external objects, may sometimes be abnormally excited when no object is really present. Many, if not most, of the phenomena designated *spectres* or *apparitions* may be ascribed to this source. An object may *appear* in consciousness either when, or when not, actually present; in other words, the appearance may be either real or unreal. A spectre or apparition is an unreal appearance.

Here will be evident the difficulty of regarding hallucinations as due to sense alone; for whenever an object, even though imaginary, is created out of sensations, whether normal or abnormal, an intellectual activity is implied. Still hallucinations imply that the sensibility is

at fault, and we must trace the source of its abnormal excitements. These must be referred to conditions in the organs of sense. Now, such conditions are reducible to two heads,—the limitation or the variation of the sensibility of an organ.

I. The sensibility of the organs is *limited* in space, in time, and in degree.

1. Organs are limited in regard to *space* by the extent to which the subdivision of their nerve-fibres is carried. Resulting from this some illusory impressions were noticed in treating the sense of touch. Thus, at an obtuse part of the skin two points may be felt as merely one; and on an acute part the distance of two points appears greater than on an obtuse part.

2. The limitation of sensibility in time arises from the facts that an impression must endure a certain length of time to excite consciousness at all, and that it tends to endure a certain length of time before it can be supplanted by another.

(a) Of the first fact numerous instances have been furnished in the phenomena of instantaneous suggestion, resulting from nvariable association, which play such a prominent part in forming many of the familiar perceptions, especially of sight.

(b) Of the second fact examples vary in the different senses. It was shown that the less intellectual senses do not recover rapidly from the effect of an impression, their inferior intellectual capacity in fact consisting in this slow recuperative power. It is in consequence of this, for example, that tastes cannot be readily distinguished in quick succession. Sights, sounds, and touches, on the other hand, were shown to be easily distinguishable, even when simultaneous; but this is the case only when the intensity of these sensations is of that moderate degree

which intellectual processes require. When an impression is unusually strong, it is apt to produce one or other of two effects; it either deadens the sensibility, or it endures after its external cause is removed, mingling with other impressions that immediately supervene. Of the former effect a curious example is found in the phenomena called *spectra*. When the eye has been intently fixed on any object of some brilliance, on its being withdrawn we are apt to see, after a short interval, an image of the object in complementary colours, as if the sensibility of the eye to the natural colours of the object had been exhausted. Thus, a red object leaves an after-image or spectrum of bluish-green colour; a white object against a black ground is succeeded by a spectrum of dark hue against a light ground.* The other effect here noticed,—the fusion of sensations in rapid succession,—is most easily produced in the case of unusually powerful impressions, but shows itself also when these are of moderate strength, as illustrated by the thaumatrope and other optical toys referred to above.† In explaining the production of tones, moreover, it was shown that some forty vibrations in a second form the limit of the discriminative power of the ear.

3. From the preceding remarks it is implied that the sensibility has a limit in regard to intensity. As already explained,‡ such a limit forms a condition both of sensibility and of the discrimination of sensations. As a condition of sensibility the limit of intensity is two-fold, on the side of excess as well as of defect. For not only is

* A very full account of these phenomena will be found in Helmholtz's *Physiologische Optik*, pp. 337-386.

† Book i., Part ii., Chapter i., § 2.

‡ Book i., Part i., Chapter i., § 2.

a certain strength of stimulus necessary to produce any sensation, but a certain weakness also. An excessively strong stimulus, or one continued long, either deadens the sensibility, as we have seen, or destroys at least the special sensibility of the organ affected, supplanting it by some general sensation of pain. A certain difference of intensity is also necessary to the discrimination of sensations; and this is the difference which an attempt has been made to formulate in a psychophysical law.

II. But not only is there a limitation of the sensibility; it is also subject to variations that are dependent on numerous conditions. This variation is noticeable both in the degree and in the kind of sensibility which an organ displays.

1. The sensibility may be either exalted or lowered in degree.

(a) The *exaltation* of sensibility, which is technically called *hyperæsthesia*, is due to various causes. In health it is the common and valuable effect of attention directed to any organ or its sensations. The reinvigoration also, derived from rest, especially from sleep, communicates a healthy heightening of the sensibility; and it is perhaps largely due to this that, for example, the morning seems to impart an increased brightness to the colouring of nature. Sometimes the heightened sensibility of an organ is due to the semi-morbid state of excessive fatigue, while its more abnormal causes are to be found in morbid nervous conditions like hypnotism or those induced by the numerous stimulants and poisons which act on the nerves. It would take us too far into the special pathology of mind, were we to enter on a detailed account of the hallucinations arising from this source.

(b) The opposite effect, a depressed sensibility, has

been less appropriately called *anæsthesia*. The discussion of it also belongs to the pathology of mind ; for its effects are among the most familiar hallucinations of mental disease.

2. There, are, however, also certain variations in the *kind* of sensibility which an organ may exhibit. Thus in the eye there is frequently met the chronic deficiency called colour-blindness, while it is also subject to such well-known temporary derangements as that produced by jaundice. In the ear, also, there occurs a defect which, by its analogy with colour-blindness, might be called tone-deafness.* For such alterations of sensibility the name *paræsthesia* has been suggested.

The conditions of the sensibility, which originate hallucinations, are thus found to be various. They are by no means confined to disease ; occasionally remarkable hallucinations surprise persons in sound health. The general soundness of health in such cases is evidenced by the fact that the patient is not deceived by the hallucinations, but sometimes even holds them under such complete control as to make them come and go at will. Thus Earl Grey used to be haunted by the vision of a gory head, which vanished, however, at his bidding. It is generally difficult, often impossible, to discover any explanation of these hallucinations in sane life ; but the difficulty is obviously due to our ignorance of all the circumstances in which the patient happened to be at the time. It may be fairly conjectured, however, that in such cases there must be some peculiar discharge of nervous energy, arising from an emotional outburst or a volitional effort, which the patient may never have

* See observations by Mr. G. Allen on a case of this defect in *Mind* for April, 1878.

dreamt of connecting with the hallucination, or perhaps from some constitutional tendency of which he may be ignorant. But if we cannot generally discover the stimulating cause of hallucinations, it is often possible to account for the peculiar form they assume. This form depends on the sense that is affected by some cause, known or unknown. Now, the sense is often determined by a person's habits. Thus, a painter generally *sees* hallucinations, while a musician *hears* them.* Sometimes in the heat of composition Dickens heard his characters speak;† and Taine mentions that the French novelist, Gustave Flaubert, while writing the story of Emma Bovary's poisoning by arsenic, became twice so veritably sick as to vomit his dinner.‡ From the fact that most of our impressions of the real world are received through the sense of sight, it might be supposed that most hallucinations must be visual; but it is questionable whether auditory hallucinations are not more frequent. There are strong reasons for believing that such is the case, at least in disease;§ and, though the reverse is said to hold good in health, yet this assertion seems by no means established.|| Professor Huxley states that to him hallucinations of hearing are more common than visual apparitions;¶ and the experience of many others will probably be found to accord with his in this respect.

Though there are many hallucinations of ordinary life

* Wundt's *Physiologische Psychologie*, Vol. ii., p. 354 (2nd ed.).

† Maudsley's *Physiology of the Mind*, p. 293.

‡ Taine's *De l'Intelligence*, Vol. i., p. 90 (4th ed.).

§ Maudsley's *Pathology of Mind*, pp. 371-6.

|| Sully's *Illusions*, p. 119, note.

¶ *Elementary Lessons in Physiology*, p. 267.

which cannot be accounted for, yet there are also many the source of which is obvious. In next section it will appear that the peculiar hallucinations of dreaming often admit of being traced to their source; and in fact the hallucinations of waking life are sometimes evidently the slowly fading residues of a dream, the excitement of nerve being prolonged even after the real world has broken in upon consciousness. Dr. Abercrombie mentions the case of a man who, while sitting up late one evening, fell asleep, and had an unpleasant dream, in which a hideous baboon figured. Startled into complete wakefulness, he walked to the middle of the room, where he continued to see the baboon against the wall for about half a minute.* After wakening in the middle of a dream I have sometimes amused myself by dwelling upon the vanishing dream-figures which retained almost the vividness of reality for some minutes, provided the eyelids were kept closed.† It will probably be found that most of the common hallucinations, whether of hearing or of sight, experienced by persons in ordinary health, come at those moments of deep reverie, which approach in character the condition of sleep.

Although many hallucinations of ordinary waking life do not obtrude any definite peculiarity of nerve to account for them, yet in most cases which have been subjected to careful investigation the patient's health has furnished some explanatory fact. Thus, a gentleman, who was subject to epileptic fits, and therefore to some

* Abercrombie's *Inquiries Concerning the Intellectual Powers*, p. 278 (13th ed.).

† A similar survival of dream-images after waking has been observed by Spinoza (*Opera*, Vol. ii., p. 216, ed. Bruder), and by Dr. Maudsley (*Physiology of the Mind*, p. 292, note).

painful disorder in the brain, found his attacks generally preceded by the spectre of a little woman in a red cloak striking him on the head with a crutch.* A lady, on being attacked with an acute inflammation in her left side, saw the traditional skeleton-figure of Death strike at her diseased side with a dart.† Dr. Maudsley mentions an analogous hallucination of smell. A gentleman of perfectly sound mind in other respects was tormented by the apparently groundless fancy that he was a source of annoyance to all his friends and neighbours by reason of a horrible odour emitted from his person. After some months an abscess formed on the lower part of the sternum, indicating the growth of some latent disease which had probably been the source of the "subjective odour."‡ It may, therefore, be inferred that even those hallucinations of ordinary life, which are seemingly the most inexplicable, would yield the secret of their origin to a thorough scientific investigation. That the explanation of these hallucinations merely requires to wait for further knowledge of the persons interested, is strikingly evinced by a fact connected with the history of Dr. Abercrombie's work on the *Intellectual Powers*. In the earlier editions an account is given of some inexplicable hallucinations, to which a gentleman of sound mind was subject; but between the fourth and fifth editions of the work the development of a serious cerebral disorder clearly indicated the source of the hallucinations.§

(B) *Illusions* are distinguished from hallucinations by the fact, that in the former the senses are not at fault, the illusory effect arising solely from the erroneous in-

* Abercrombie's *Intellectual Powers*, p. 284.

† *Ibid.*, p. 286.

‡ Maudsley *Pathology of Mind*, pp. 376-7.

§ See p. 276, 13th ed.

tellectual process which misinterprets a normal impression of sense. In the first chapter of this Part, while illustrating the formation of ordinary perceptions, we have had such numerous opportunities of noticing and explaining illusory cognitions of this sort, that it is unnecessary to dwell upon them at further length here. We may accordingly proceed to describe some of the most familiar states of consciousness, in which hallucinations and illusions hold sway.

§ 2.—*Dreaming.*

Among the facts of our mental life, which derive their peculiar character from being composed mainly of illusory cognitions, a prominent place must be assigned to dreams; and the analysis of these will be found to furnish the fundamental principles, on which a large number of others should be explained. In the analysis of dreaming it will be of some advantage to describe the distinctive peculiarities of the state, before proceeding to indicate the psychological principles which furnish their scientific explanation.

(A) The peculiarities which commonly distinguish dream-fancies from those of waking life, are two. The first is the fantastic combination of circumstances by which dreams are usually characterised; the second is the irresistible appearance of their reality.

I. The former of these is so obtrusive a characteristic of dreaming, that in our waking life any improbable fancy is very commonly described as a dream. All the ordinary probabilities of the real world, whether founded on internal character or external circumstances, are set at naught in the world of dreams. Here the coward achieves deeds of heroic courage, while the brave man is

mortified by the meanness of his poltroonery. The guilty sometimes dream of an innocence which is unhappily unknown to them in real life, while the pure mind is shocked at times by dreaming of being seduced into the most improbable sins. The untravelled lover of domestic comforts often spends his nights in wandering over the face of the earth, while the restless wanderer settles down to the quiet routine of home. The man, who in the real world was never known to be guilty of an eccentric action, rides in his sleep along the edge of precipices, seats himself on dizzy pinnacles, rushes into mad encounters with wild beasts, and exposes himself to all sorts of ridiculously needless dangers. In like manner there are no external restrictions—no obstacles of time or space—in the world of dreams. A few seconds carry us round the globe; and the events of years may be packed into a single night, or even into a few minutes. Persons who are separated by a hemisphere in space, or even by centuries in time, enter into familiar intercourse in the dreamer's society; and those friends, who have long ago passed beyond the veil, descend to him from the spirit-world as readily as they are supposed to come for the purpose of rapping upon tables at a spiritualistic *séance*. We pass from place to place in our dreams as if we were charmed by the cap of Fortunatus or shod in three-league-boots; we spurn all ordinary modes of locomotion, for we can float through the atmosphere as easily as if aerial navigation were no longer among the problems which have yet to be solved. Whether in its pleasanter or in its sadder aspects, the conditions of human life are extravagantly exaggerated in our dreams. They make us drink at times a draught of horror which is happily too large for the measured cup of actual woe; and they lull us again by the revelation of ecstasies

which transcend in beauty and in joy the sober realities of human life.

It thus appears that the dreamer creates for himself a world which is governed by laws of its own. The only laws which he cannot set aside are the laws of his own mind. But it must not be supposed essential to a dream, that it should possess this fantastic character. In familiar experience, dreams are often marred by no improbability which would render them impossible as real events. This fact, though at first sight apparently a difficulty in any theory of dreams, will be found to assist in their explanation.

II. The second characteristic of dreams is the irresistible appearance of their reality. This illusory reality is so strong, that it is not weakened by any improbability, however extravagant. The strength of the illusion is also strikingly evidenced by two analogous facts, both of which are familiar in the experience of nearly all dreamers. The first is the fact that often, as the real world breaks in upon the middle of a dream, we find ourselves in doubt for a moment whether the dream is not a reality—in other words, which is the dream-world, which the real. Analogous to this is the other fact, that often a real event, especially if it has been of an extraordinary character, seems long afterwards like a dream; and, indeed, most men have probably been in doubt at times with reference to some such event, whether it was a dream or a reality.

The same remark, however, which was made about the former peculiarity of dreams, must also qualify this: the appearance of reality is by no means absolutely essential to a dream; sometimes we are conscious that a dream is unreal. This apparent anomaly, instead of

being a difficulty, will be found rather to assist in the explanation of dreams.

(B) In proceeding to such an explanation it is desirable to bear in mind that the course of thought in sleep as well as in waking hours is governed by the laws of association. If you fancy any event or scene in a day-dream, its detail must all be suggested in accordance with these laws; and so are all the details of any event or scene in the dreams of sleep. It is desirable also to remember, that a sensation requires merely some action in a nerve; and if this action can be produced by any internal excitement, without the presence of an external body, the same result will follow as if an external body were there. Such "subjective sensations" have been already noticed in the preceding section as the source of hallucinations.

Keeping these facts in view, we are prepared to explain the characteristics by which dreaming is distinguished from waking consciousness. The explanation is evidently to be sought in the peculiar condition of body and mind which sleep implies. Sleep is a cessation of activity in the brain, as well as generally in the nervous system to which the brain belongs. The thoughts and feelings which make up our waking life imply a large consumption of those elements of food which go to supply nerve and brain. After this has gone on for a considerable part of the twenty-four hours, the brain and nerves have spent most of the force at their disposal, and do their work more feebly. You may stimulate them for a time by tea, coffee, alcohol, tobacco, agreeable conversation, exciting work, and other artifices; but at last they cease work from pure exhaustion. The nerves of hearing, sight, and touch are no longer affected

by ordinary sounds, sights, and contacts; all thought, all consciousness fades away.

Now, it is known that the brain becomes comparatively bloodless in sleep, while there is a partial return of blood to its vessels when the sleep is disturbed by the imperfect consciousness of dreams; and the quantity of blood in its vessels becomes greatly increased with the perfect restoration of consciousness on awaking. Dreaming is, therefore, a state in which we are half-asleep and half-awake—sufficiently awake to have some consciousness, but sufficiently asleep to be unable to control the direction of our consciousness. In this we have an explanation of the generally admitted fact, that most dreams take place at the transition from waking to sleep or, perhaps more commonly, from sleep to waking.

I. Here, then, we have an obvious explanation of the first characteristic of dreams, their ludicrous improbability. The state of the dreamer is evidently one in which the mind is comparatively torpid—is doing little or no work. "Dreams are the children of an idle brain."* Now, when the mind is doing good work, we do not surrender ourselves to every idle fancy that is suggested; on the contrary, we resolutely exclude every thought which is not connected with the work of the mind; we control the direction of our thoughts. But in a torpid or inactive state of mind we let our thoughts take any order in which they happen to be suggested. Such a state we often indulge in during our waking hours; and it resembles dreaming so obviously, that popular language calls it a *daydream*, or by the French equivalent of *reverie*. The improbable character of the pictures, with which we allow ourselves to be amused in

* *Romeo and Juliet*, Act i., Scene 4.

such reverie, is witnessed by the fact, that the man who indulges in them is said to be building *castles in the air* or *châteaux en Espagne*. If our thoughts can form such fantastic combinations even during our waking life, when we never lose control of them altogether, is it wonderful that they run into an utterly lawless riot when the torpidity of the mind leaves them undirected by any active purpose?

The state of the dreamer's consciousness, then, is one in which the higher function of thought or comparison, implying (as the third part of this Book will show) voluntary control, is dormant, and only the more mechanical function of association is active.* After the lengthy analysis of our perceptions, it need not be repeated that the meaning of an impression on any sense

* It is one of the fine comparisons of Hegel that discovers an analogy in waking and sleep to the great cosmic phenomena of day and night. At night the mere mechanical forces, on which the existence of the earth in the planetary system depends, continue their movements: but the subtler forces, connected with the calorific, actinic, and optical action of light, cease; and organic life in plant and animal is affected thereby. Leaving the plant out of account, we find that, in the animal, as in the vast cosmic bodies during night, it is only the forces necessary to existence that continue during sleep—the forces of *organic* life. The higher forces of *animal* life—sensibility and irritability—cease. Now, the soul—the consciousness—in so far as it is a natural phenomenon, has an analogy with the other phenomena of nature. Its lower functions do not cease in sleep; sensation, and even ideas that have been originally the result of intellectual processes, may still be excited; but they are arranged solely by the laws of suggestion, not by the categories of the understanding. The higher function of reason—comparison—by which sensations are interpreted in their real relations, is dormant. Ideas appear merely in subjective, fortuitous, superficial association; things lose all necessary, objective, rational connection. (See Hegel's *Encyklopædie*, § 398.)

depends on our interpretation of it ; and as that interpretation implies a somewhat complicated intellectual effort both of comparison and suggestion, we cannot be astonished that it is beyond the sluggish intellect of the sleeper. As a dream is a partial disturbance of sleep, some at least of the senses are sufficiently roused to stir in consciousness sensations which are generally so obscure as to be all the more easily misinterpreted ; and the misinterpretation is commonly directed by any suggestion that happens to predominate at the time. That this origin of dreams is no mere conjecture, but a familiar fact, is implied in the delicious fancy of Queen Mab, as

" She gallops night by night
Through lovers' brains, and then they dream of love ;
O'er courtiers' knees, that dream on courtesies straight ;
O'er lawyers' fingers, who straight dream on fees ;
O'er ladies' lips, who straight on kisses dream.
Sometime she gallops o'er a courtier's nose,
And then dreams he of smelling out a suit ;
And sometime comes she with a tithe-pig's tail,
Tickling a parson's nose as a' lies asleep,
Then dreams he of another benefice.
Sometime she driveth o'er a soldier's neck,
And then he dreams of cutting foreign throats,
Of breaches, ambuscadoes, Spanish blades,
Of health's five fathom deep ; and then anon
Drums in his ear, at which he starts and wakes." *

If we took the necessary trouble, we might often, without calling in the aid of any poetical fiction, trace a dream not only to its originating sensation, but also through the suggestion from which it received its peculiar shape. Thus Dr. Gregory relates that in earlier life he had ascended Mount Vesuvius, and during the ascent had felt the heat

* *Romeo and Juliet*, Act i., Scene 4.

of the mountain on his feet. Long subsequently he had read an account of Mount Etna, though he had never seen it. Some time afterwards he went to bed one night with a vessel of hot water at his feet; and during the course of his sleep he dreamt that he was walking up Mount Etna, and felt the ground under his feet warm. On another occasion he mentions that he had read an account of the Hudson's Bay Territory, which gave a vivid description of its severe climate. One night, shortly afterwards, he dreamt of being in that territory, and suffering intensely from the cold; he awoke, and found that in his sleep he had kicked the bedclothes off.*

The obscure sensible impressions, which thus suggest fantastic interpretations in the torpid mind, will easily explain those horrors of dream-life which have their source in the various painful sensations of indigestion. To such obscure impressions also can be referred that large class of horrid dreams which go by the name of *nightmare*, in which the common circumstance is an effort to do something, with the feeling of inability to do it. These dreams will be generally found to arise from impeded respiration. The sleeper is lying on his back or face, or in some other position in which his chest cannot freely expand to allow a full inhalation; and naturally, therefore, he has a dim sensation of endeavouring to perform the most essential of the vital processes, while there is some difficulty in its performance which he cannot overcome. This sensation is of course enhanced if there is the additional oppression arising from a flatulent or overloaded stomach. But the general result

* Abercrombie's *Inquiries Concerning the Intellectual Powers*, p. 201.

is the same in all, varied only according to the habits or circumstances of each individual.*

Other facts of dream life receive a similar explanation. It is well known, for example, that questions addressed to a dreamer, especially if they are connected with the subject of his dream, will often elicit answers which show that the question has been heard, and has even become mixed up with some of his amusing fancies. It is also a familiar experience of many, that they can waken at a fixed hour by determining upon it before going to sleep. This would seem to imply that, notwithstanding the torpid state of the sensibility in general, a certain degree of wakefulness was preserved, sufficient to keep note of time, without preventing the refreshment of sleep; and it is known that the dominant idea of rising at a particular hour occasionally gives shape to a dream.

It was noticed above that, though dreams generally exhibit a whimsical character, yet this is by no means essential; for the fictions of dreaming may often be less strange than the facts of real life. This is not at all inconsistent with the theory which ascribes the improbable caprices of dreams to the fact of the mind being in such a dormant state that it is unable to control the directions of its thoughts; for though thoughts, when uncontrolled, may run riot, yet it is quite possible for them to take a perfectly sober course. In fact, the

* Nightmares with me take a turn which is evidently suggested by professional work. I am standing in front of an audience, who are waiting to hear me speak; but, although often ideas and the words to express them seem to rise with greater readiness and brilliance than during waking hours, the most frantic efforts of the vocal organs fail to elicit a single sound.

subject of a dream may sometimes control the direction of our thoughts, and produce thereby a concentration of mind, of which we are incapable amid the distractions of the waking world. As a result of this, it has been the testimony of several distinguished men, that in sleep they have seen their way through problems which had perplexed their waking hours; and Coleridge informs us that his poem of *Kubla Khan* was composed in a dream.*

II. There still remains for explanation the second peculiarity of dream fancies, the irresistible illusion of their reality. This peculiarity, too, must be attributed to the dormant state of the mind. This torpidity of mind implies two circumstances, which explain why the imagery of our dreams should appear so real in comparison with any imaginations of our waking consciousness.

1. The first of these circumstances is the absence of any impressions from the real world to exhibit, by force of contrast, the unreality of the images which play before us in dreams. That the want of this contrast has to do with the illusory reality of dreams, must appear from the fact that a dream is instantaneously dispelled by any violent sensation, such as a loud noise, which suddenly rouses the dreamer to waking life. It is an interesting fact, which illustrates the same effect, that spectral illusions, which have tormented a patient in a darkened chamber, often vanish by simply letting in the light, and revealing thereby the realities around.

2. A second circumstance connected with the condition of the sleeper also accounts for the illusory reality of his dreams. The vividness, with which we can call up

* Several facts of this sort are related by Mr. Dallas in *The Gay Science*, Vol. i., pp. 232-4.

an image of anything, depends, among other conditions, on the sense, through which the image was first received, being occupied or not at the time. It is difficult to represent distinctly the visual appearance of anything, if the eyes are at the moment engaged in examining some actual object; and this is the reason why many people instinctively close the eyes during intense efforts of thought or recollection. It is equally difficult to recall distinctly a tune while the ears are being assailed with actual music or loud talk; and the same fact is noticeable in the case of the other senses. It is, indeed, for this reason that we can generally study to better purpose amid quiet surroundings and familiar scenes. Now, in sleep the senses are so torpid that they disturb us very little with impressions from the outside world at all; and therefore any images that are suggested, being allowed to absorb the consciousness, become as vivid as if they were produced by real objects. An interesting result occasionally follows from this. By one of the Secondary Laws of Suggestion we have seen that, the more vivid an idea is, it becomes the more powerfully suggestive; and therefore it sometimes happens that facts are suggested in a dream, which had been totally forgotten in waking life. Several interesting anecdotes are told of persons who recovered in a dream important information regarding events which they had fruitlessly endeavoured to recollect when awake.*

* Some of these are preserved by Abercrombie (*Inquiries Concerning the Intellectual Powers*, pp. 205-11). Dr. O. W. Holmes relates a story of a lost bond having been recovered by its owner recollecting, during the excitement of drowning from which he was saved, the place where it had been laid (*Mechanism in Thought and Morals*, p. 75).

But how is it that sometimes a dream loses its deceptive reality, and we become aware that it *is* a dream? That such is not infrequently the case, must have been the experience of most dreamers; and there have been instances of men, tormented by nightmare, who have succeeded in vanquishing its delusions by resolving, as they went to sleep, that they would treat its horrid fantasies as harmless unrealities. Dr. Reid relates that in his early life, being tormented almost every night for a while by frightful dreams, he resolved to try and remember that his terrors were unreal. After some fruitless efforts he was at last successful; and "often," he says, "when I was sliding over a precipice into the abyss, I recollected that it was all a dream, and boldly jumped down." * Such effects are obviously to be explained from the circumstance that the dreamer is not only half-asleep, but also half-awake, and that he tends either to relapse into the unconsciousness of profound slumber, or to struggle into the distinct consciousness of waking life. Now, if the latter should be the course of his dream, and if he is not suddenly startled into complete wakefulness, there will often be a stage in his dream-life, at which its spectres continue to hover before his mind, but he is sufficiently aroused to be perfectly conscious of their spectral nature. It will generally be found, in fact, that the dreamer awakens immediately after realizing that his dream is a dream.

Perhaps it would be regarded as an incomplete discussion, which did not refer to those remarkable coincidences between dreams and real events, which play a conspicuous part in the literature of modern spiritualism.

* Letter in Stewart's *Account of the Life and Writings of Thomas Reid*, near the end.

It cannot be denied that such coincidences have occurred, in which dreams seem to have contained prognostications with regard to future events, or information about contemporary events taking place in another part of the world. But it should not be forgotten that it is seldom, if ever, possible to tell how much a good story of this sort may have been embellished even by the original narrator, and still more by imaginative storytellers. Moreover, it must be remembered that, while we hear all the remarkable coincidences between dreams and real occurrences, we seldom hear of those dreams which had all the appearance of being significant and yet turned out after all to be meaningless foolery of the imagination. I have known instances of dreams which at the time deeply impressed the dreamers with the events, and were found to indicate nothing but a little indigestion or an uneasy position of the body. Indeed, when it is borne in mind that there are probably several hundred millions of dreams every night, perhaps we ought to wonder, not that such coincidences are so many, but that they are so few. Besides, such dreams are practically worthless. Like the prophecies of Cassandra, they are fated to be received with incredulity. Few men will go even the length of Antigonus :—

“ Dreams are toys ;
Yet for this once, yea superstitiously,
I will be squared by this.” *

For who is to determine when a dream is a trustworthy informer, and not merely “a false creation proceeding from a heat-oppressed brain”?

* *Winter's Tale*, Act iii., Scene 3.

§ 3.—*Hypnotic States.*

The term *hypnotic*, from the Greek word for sleep, was suggested by an eminent English surgeon, Mr. Braid, to describe a class of phenomena which have their source in a nervous condition resembling sleep. The affinity between these phenomena and dreams is so remarkable, that the former will be found to have received the chief part of their explanation in the treatment of the latter. At the same time, hypnotic phenomena are so interesting in many respects that they deserve a separate consideration. We shall, therefore, first describe their distinctive peculiarities, and then inquire how these may be explained.

(A) In studying the characteristics of hypnotism, we come upon one that is fundamental.

I. This primary characteristic is a nervous condition resembling ordinary sleep. The condition may be induced either involuntarily by some disorder of the nervous system, or voluntarily by some artifice of a monotonous character, such as is often adopted for the purpose of overcoming sleeplessness.

1. Of the hypnotic states which come on *involuntarily* the most familiar is common somnambulism. The fact of walking in sleep, which is alone expressed by this term, although a common phenomenon, is by no means an essential or distinctive characteristic, of the state. Frequently it consists in mere talk during sleep, and at this stage can scarcely be distinguished from those dreams in which the dreamer is heard speaking, at times in reply to questions. An interesting case in point is recorded of a military gentleman, whose brother-officers often amused themselves in directing the course of his

dreams by suggestions whispered into his ear.* This, though given as a case of ordinary dreaming, ought rather to be regarded as one of somnambulism; for the subject of the experiment was continually roused to action under the impulse of his suggested dreams.

But there are also instances in which some of the most astonishing phenomena of somnambulism are exhibited without the patient leaving his bed. Such is the case of Agnes Drummond, than which there is perhaps nothing more marvellous in the history of the abnormal states of mind. This girl had evidently suffered some serious injury to her nervous system from an accident in early life. The effect of this was to render her uncommonly stupid in waking life, but subject to hypnotic attacks, in which she displayed an extraordinary ability of various kinds. While in an unusually profound sleep she was often heard producing with her mouth a skilful imitation of elaborate musical compositions which she had heard played by an itinerant fiddler, or discoursing, with great beauty of language and illustration, on every imaginable subject.†

More commonly, however, the somnambulist rises in his sleep, and proceeds to perform various actions. Sometimes the motive of his actions is undiscoverable; but often they are such as he was occupied with during the day. The farmer ploughs or threshes, or does some other farm-labour. The school-boy sits down to his task. The clergyman writes his sermon; the judge, his

* Abercrombie's *Inquiries Concerning the Intellectual Powers*, pp. 202-4.

† Dugald Stewart's *Works*, Vol. x., pp. cliii.-clix. See also Abercrombie's *Inquiries Concerning the Intellectual Powers*, pp. 232-5. Abercrombie does not give the girl's name.

decision; the author, a part of the book on which he is engaged. The man of science works at, and sometimes succeeds in solving, the problem which is perplexing him at the time.

Some patients are liable to paroxysms of an hypnotic character in waking life, and during these exhibit all the phenomena characteristic of nocturnal somnambulism.

2. But it has been found possible to induce voluntarily a state essentially similar to ordinary somnambulism. The marvellous nature of many of the phenomena exhibited in this state has produced such an impression, not only on the popular mind, but on the minds of many scientific inquirers, as to upset their usual habits of scientific caution; and as a result, various unscientific hypotheses have been suggested to account for the phenomena either by some occult force of nature or by some occult operation of one of the known forces. Among these hypotheses a prominent place must be given to that of Mesmer, who ascribed the phenomena to animal magnetism. Others, again—the representatives of the so-called electro-biology—held that electricity is the influence at work; while the Baron Von Reichenbach imagined the effects to be due to an universally diffused force, which, after the Teutonic god Odin, he named the Od or Odylic force. But the subsequent remarks will show that even the most startling phenomena of this state do not require for their explanation any force beyond the known agencies which are at work in the animal and mental nature of man.

Before proceeding further, however, it may be observed that some of the essential characteristics of hypnotism are found in many of those morbid social phenomena of an hysterical nature, which were often epidemic in ancient and mediæval communities, but



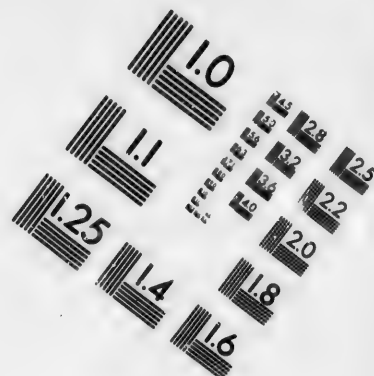
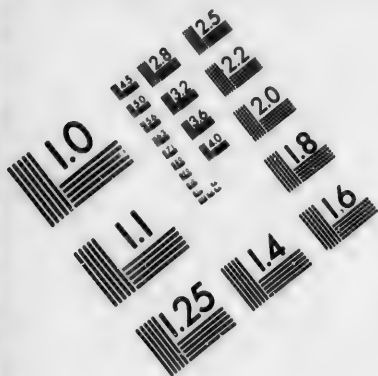
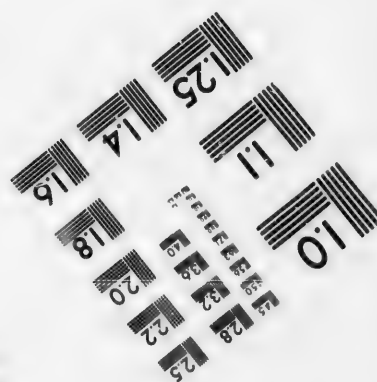
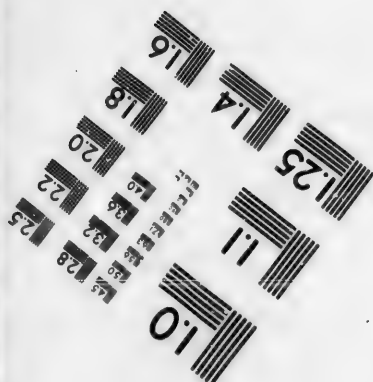
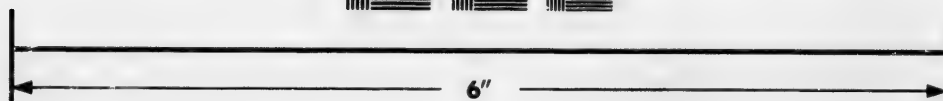
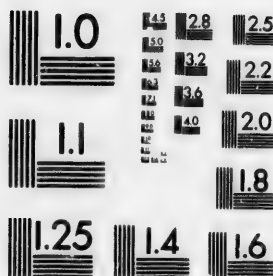


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic
Sciences
Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

18
20
22
25

10

are fortunately disappearing from the life of modern civilisation.

II. It is evident that, while there is a certain resemblance between the hypnotic state and ordinary sleep with its dreams, there is also a marked difference. While dreaming proper is a passive state in which the patient simply allows various images to pass uncontrolled through his consciousness, the hypnotic patient is always active; and there is, therefore, a propriety in the expression, which describes somnambulism as "a dream acted." How is this to be more specially defined? It seems that, as in ordinary sleep, there is a general torpidity of the cerebro-spinal system, only that the torpidity of hypnotism is much more profound. But combined with this impassive torpidity of the cerebro-spinal system in general, there remains an abnormal activity in certain portions, or at least a capability in certain portions of being excited to abnormal activity. Accordingly, ideas are able to take an extraordinary hold on the somnambulist's mind, and to concentrate his whole mental and bodily energy in a degree altogether impossible in waking life.

In the hypnotic state, therefore, the patient's mind is dominated by an idea or set of ideas, creating an irresistible conviction that he does or does not experience certain sensations, that he can or cannot do certain actions. In ordinary nocturnal somnambulism the dominant ideas are suggested, as in sleep, by obscure sensible impressions or by the laws of association; and it is noteworthy that the mind is so absorbed in the dominant idea, that attention is scarcely ever given to any suggestion lying wholly out of its sphere. Still, it is possible for another person with some tact to control the ideas which sway the somnambulist; and this is com-

monly done by the operator in artificial hypnotism. It appears that the muscular sense is that by which the operator can most easily work upon his subject; and certainly many of the most marvellous phenomena of the hypnotic state are due to an almost preternatural exaltation of muscular sensibility and power.

III. An additional peculiarity of this state is its disconnection with the ordinary consciousness of waking life. This disconnection appears in two ways.

1. It involves an oblivion in waking life of what has been done in the hypnotic state. The oblivion is frequently total, though there is sometimes a very vague reminiscence of something having taken place. But in all cases the oblivion is so complete as to constitute a practical separation of somnambulatory acts from the personality of the patient; and, accordingly, in more than one instance homicides have been successfully defended on the ground of their having been perpetrated in a state of somnambulism.*

2. But the disconnection of hypnotic and ordinary mental life is further evinced in the fact, that with the waking oblivion of hypnotic states there is often evidently a reminiscence in one such state of what has been done in another.

It appears, therefore, that, while hypnotism exhibits an obvious affinity with sleep and dreaming, it is yet distinguished, on the one hand, by a completer torpidity than ordinary sleep, on the other hand, by a more active excitement than ordinary dreaming; and this extraordinary

* Dallas' *The Gay Science*, Vol. i., p. 234; O. W. Holmes' *Mechanism in Thought and Morals*, p. 41. See also *Annales Medico-psychologiques* for 1881, p. 468, cited in the *Fortnightly Review* for November, 1885, p. 646 (Am. ed.).

activity in one part of the system, combined with extraordinary torpidity in the rest, produces a sort of double consciousness, disconnecting the normal from the abnormal mental life of the patient. These are the phenomena which require explanation in this remarkable state of mind.

(B) The true scientific spirit, in which to approach unusual phenomena, is that which, recognising all their extraordinary character, in so far as verified by accurate observations, yet seeks to account for them by known laws, rather than by the hypothesis of occult agencies, or occult operations of agencies that are known. Our object will, therefore, be to discover, in the ordinary mental life of man, phenomena sufficiently resembling those of hypnotism to warrant us in believing that both are due to the same causes. The needlessness of any hypothetical agency to account for hypnotic phenomena is strikingly indicated by the results of a commission appointed by the French government to examine Mesmer's theory of animal magnetism. After a careful scientific investigation, this commission reported that all the phenomena ascribed to the effect of magnetism on the human body, could be produced by simply making persons imagine they were magnetised, even if the process of magnetising were not performed at all, while none of the phenomena were manifested when that process was really performed without the knowledge of the persons subjected to experiment. It is evident, therefore, that the phenomena in question were due to the mind being possessed with a certain idea.

Accordingly, to find the analogues of hypnotic phenomena in ordinary mental life, we must observe the effects which are commonly produced by the mind being absorbed in one subject. These effects have been already

in some measure referred to, where mental abstraction was analysed, and shown to be the complement or reverse of attention.* In this necessary union of attention with abstraction, we have a familiar parallel to the extraordinary concentration of the somnambulist's mind on one subject along with his equally extraordinary insensibility to everything else. This parallel will appear the more significant, the more carefully it is followed into detail.

In the first place, it has been already observed that the abstraction, which is the necessary counterpart of concentrated attention, often reaches the extreme form of absentmindedness; and authenticated instances of this mental condition do not fall very far short of the torpor which the somnambulist displays in regard to everything beyond the range of his dominant ideas.

But it is the other side of these phenomena that chiefly requires to be considered in this connection. The effect of attention, in ordinary life, is to concentrate the energy of an individual to such a degree, that he is enabled to achieve results beyond the power of a distracted mind. Now, these results are sometimes not altogether out of proportion to those which flow from the intense mental concentration of the somnambulist. Even if we leave out of account the great achievements of science and art, which have been rendered possible by the power of intense concentration on the part of scientific and artistic minds, and which, from their originality, often imply intellectual activities of a more unusual character than even the marvels of hypnotism, there are familiar facts in the humbler mental life of every day, which give an insight into the source of these marvels.

* See Chapter ii. of this Part, § 1.

The intense mental concentration of the hypnotic patient often assumes the form of an overpowering belief that he can or cannot do certain actions. The increased ability and disability, which are thus generated, are paralleled by the well-known effects of excessive confidence and diffidence in daily experience. These effects are realised, in a homely form, which makes them familiar to all men, in games of skill. Success at the outset is one of the most important conditions of success at the close. The confidence thus awakened in the player's mind imparts an increased firmness to nerve and muscle, enabling him to direct his movements with precision ; so truly has it been said of those who make a good start,—

“*Hos successus alit ; possunt, quia posse videntur.*”•

On the other hand, an unfortunate slip at the commencement of a game, on the part even of one who usually plays well, may often be observed creating a distrust in one's powers,—a feeling of anxious timidity,—which is almost sure to interfere with accuracy of stroke. This effect of confidence is, in truth, similar to that which is produced by any emotion powerful enough to concentrate an individual's energies on one object. It is thus that under the influence of high enthusiasms men become capable of achievements, for which the tamer motives of everyday life are inadequate ; and occasionally a human career is blighted by a single crime, to which the criminal might never have been seduced but for the overmastering temptation of a moment.

• *Aeneid*, v., 231.

The irresistible subjection of the somnambulist's mind to a dominant idea often assumes the form of a belief that he does or does not experience certain sensations. This phenomenon scarcely requires any elucidation by reference to other spheres of mental life, after what has been said, in the first section of this chapter, on the hallucinations and illusions to which even the same mind is sometimes subject. Here a single additional remark may appropriately be made on the effect of mere imagination in creating actual sensations. Numerous instances are recorded of persons being made to feel sensations of almost every variety under the influence of strong conviction, and such instances could probably be multiplied from the experience of most men. It is, in fact, not an uncommon social amusement to find sport at a friend's expense by making him the victim of some harmless hallucination ; and any one may by an experiment of this sort discover how easily subjective sensations can be excited.* The ease with which a person may be thus victimised, is of a piece with the power which the mesmeric operator wields over his subject.

Nor is the disconnection of hypnotic and normal

*The *Memoirs of Dr. Chalmers* relate two such pleasantries, intended to exhibit imagination overriding sense. In one the victim is made to feel the taste of coffee, in another the smell of sulphur. (Vol. i., pp. 191-3). A remarkable case is known to me of a farm-servant who, treading inadvertently on a harrow, saw one of its prongs protruding through the upper leather of his boot. "My God !" he exclaimed, "I have got lockjaw ;" and fell into a sort of tetanic paroxysm. He was carried in this state into the house, his boot tenderly pulled off, when it was found that the prong had passed without hurting him between two of his toes. Yet it was some hours before he could free himself from the terror of lockjaw.

consciousness without a parallel in our ordinary mental life. The oblivion of hypnotic actions in waking life is analogous to the difficulty of reinstating at will moments of intense mental absorption, whether in intellectual work or in emotional outburst. This difficulty is probably owing to the fact, that all such absorption involves an excessive waste of energy which is essentially destructive, and that the destructive nature of the state forbids its reproduction even in the fainter form of memory. It is from this cause that human character often presents combinations apparently the most incongruous. For the ecstasies of the enthusiast, however ennobling their influence might be, cannot be recalled with sufficient distinctness to exert that influence on his conduct; and therefore his life may be separated into two parts, which seem not only quite distinct, but even antagonistic to each other. A fanatic of the type of Robespierre or a devout inquisitor may indulge one day in a gush of religious fervour, and the next find diabolical satisfaction in a butchery at which healthy human nature stands aghast.*

The disconnection of hypnotic and normal consciousness is in some respects also illustrated by the phenomena of habitual and dexterous actions. These exhibit an accuracy which parallels that of the somnambulist's conduct,—an accuracy which disappears under any attempt at conscious direction as completely as the somnambulist's increase of power is destroyed by the restoration of normal consciousness. There is also a separation in consciousness between the actions that are

* Some striking instances of such incongruous combinations in moral character are given by Mr. Lecky in his *History of European Morals*, Vol. i., pp. 305-8.

done under the influence of habit and those that are governed by conscious volition,—a separation so complete, that we often go through a long series of habitual actions without being able to recall a single detail of the series. Even the fact that a patient in one hypnotic state can recall what he did in a previous state,—this connection of hypnotic states with each other, while they remain disconnected with ordinary consciousness, is not without an analogue in the phenomena of habitual actions. For it is often observable that, if we break down in the performance of such action, we start the whole series afresh with better prospects of success; that is to say, by going back to the beginning, or to some well-marked point in the series, we endeavour to reinstate the condition of habitual activity in the hope of being able to proceed to the end of the series with that mechanical accuracy which we despair of attaining by any conscious direction. This is illustrated, not only in ordinary cases of repeating by rote, but still more strikingly in that extraordinary memory which some exhibit, and which is almost always of a mechanical character. For example, the scholarly Scottish poet, Leyden, could repeat verbatim anything, even a dry legal document, by reading it once. But he found this mechanical memory inconvenient; for, if he wished to recall any particular point, he had to start from the beginning and repeat the whole mentally till he came to the passage required.* So necessary and so effective is the expedient of reinstating the whole of the associated circumstances upon which suggestion depends. An additional illustration of this is afforded by the amusing,

* Abercrombie's *Intellectual Powers*, p. 47.

but significant fact, that instances are on record of a man doing an action when drunk, wholly unable to remember it when sober, but recollecting it at once on getting drunk again.*

The above remarks indicate the general explanation of hypnotic phenomena, which seems to be demanded by the present state of our knowledge. At the same time it must not be concealed, that there are many particular details which are far from having received a complete psychological explanation; and, on its physiological side, the whole subject presents still a wide field of research for cerebral physiology.

To the student unfamiliar with the facts, the general description of this section can scarcely convey any idea of their marvellous nature; but it was impossible to illustrate the subject more fully without giving the whole treatment too much of a merely anecdotal character. A fuller narrative of the interesting facts connected with this region of mental life must be sought in the special literature which it has called forth. Some of this literature has been occasionally cited above; and it is constantly receiving accessions, either in the periodicals of the day, or in independent monographs. Dr. Carpenter gives considerable space to the subject in his *Principles of Mental Physiology*, with which may be compared his two lectures on *Mesmerism, Spiritualism, etc., historically and critically considered*. Two papers by Mr. G. Stanley Hall in *Mind* (Number xxi., p. 98, and Number xxx., p. 170), give some account of the most recent researches both in Europe and in America. Wundt's *Physiologische Psychologie* (Vol. ii., pp. 375-8) gives a sketch of foreign

* *Ibid.*, p. 233.

researches and literature. It may be added that the societies, recently instituted on both sides of the Atlantic for the promotion of psychical research, will probably at least succeed in collecting a body of facts connected with the abnormal activities of mind, free from those imaginative embellishments which, however pardonable in the art of the story-teller, are fatal to scientific inquiry. Some idea of the work already done by the English Society may be gained from the recent work, *Phantasms of the Living*, by Mr. Gurney, Mr. Myers, and Mr. Podmore. With this may be compared four articles by Mr. Gurney in *Mind* (Numbers 33, 36, 46 and 47).

CHAPTER VI.

GENERAL NATURE OF KNOWLEDGE.

THE explanation of our intellectual life would not be complete, if we did not attempt to generalise the detailed analyses through which we have gone. We have traced intelligence gradually evolving, out of associable and comparable sensations, perceptions of individual objects, out of associable and comparable objects, classes of those that resemble. Then we have seen it evolving processes, by which it extends our knowledge from individuals to classes, and from classes to individuals, with a consciousness of the reason for the extension. And lastly, we have followed it in its loftier movements, through the philosophic, the artistic, the moral, and the religious consciousness, seeking the interpretation of isolated particulars in the light of the universal order which they express, and stripping that order of its dead abstractness by finding it in the living particulars.

To sum up, there is thus evolved to our consciousness a world of *objects*, placed over against *ourselves*, extending throughout an immeasurable *space*, and undergoing alterations during a limitless *time*—alterations which are produced in the objects by each other in consequence of their *reciprocal causality*. There are, therefore, certain supreme categories, under which the intelligible world i

thought, and which are indicated in the terms italicised in the preceding sentence. These being the universal categories of the intelligible world, their interpretation involves the interpretation of the general nature of knowledge. Consequently, we find that the problem of the ultimate generalisations of psychology gathers round these categories and their implications.

The discussion of this problem carries us into the most controverted field of our science. The controversy over this field has been perplexed by being mingled with a philosophical question which, though having an affinity with the psychological, still in strictness lies wholly beyond its sphere. The philosopher inquires into the validity of the categories as facts in the real existence of the world. To the psychologist, on the other hand, they are simply facts of human consciousness, which call for scientific explanation as far as the processes of science can be of service for this purpose. Accordingly, these universal factors of intelligence are now to be examined in a purely psychological aspect. Even in this aspect the examination has furnished a subject of extensive controversy. Among the innumerable theories which the controversy has called forth, there are commonly distinguished two general tendencies of speculation. Without attempting to describe these tendencies in a single sentence, it may be said, by way of preliminary explanation, that one, starting from the assumption of a world of realities, such as is formed in our consciousness, explains all factors of intelligence as being alike products of these realities. The other theory, on the contrary, starts from self-conscious intelligence as the primary fact of all science, sees in the realities of the world no meaning except as constructions of intelligence, and therefore refuses to find in these realities the source of intelligence

itself. The former of these two tendencies is variously named, for reasons which will appear in the sequel, Realism, Empiricism, Sensationalism or Sensualism; the latter is distinguished by such names as Idealism, Transcendentalism, Intuitionism. Before proceeding to the discussion of these rival systems of thought, there are some terms of frequent occurrence in the controversy, with the exact use of which the student must be made familiar.

1. The term Intuition, from which one of the above systems receives its name, expresses etymologically the act of looking upon (or into?) anything. As we seem to gain an immediate knowledge of things by looking at them, intuition is very commonly applied, in general literature, to any cognition which is given in a sudden flash of consciousness without the intermediation of a lengthy process of reasoning. Now, if there are any knowledges involved in the very nature of knowledge itself, they cannot be the product of any cognitive process; for without them the process would itself be impossible. For that reason they are called intuitions.

2. Such knowledges are also said to be *transcendental*. They do not take co-ordinate rank with other factors of knowledge, which are merely adventitious. As conditions essential to the very possibility of knowledge, they may be said to transcend all its adventitious factors.

3. *A priori* is another expression applied to such knowledges, especially since the time of Kant; while all other constituents of our knowledge are named *a posteriori*.* A cognition *a priori* is, literally, one that

* The Germans have even made these expressions into regular adjectives, as we might do by adopting the forms *aprioric* and *aposterioric*.

proceeds from what is prior, as an *a posteriori* cognition proceeds from what is posterior. It is on this account that arguments have been distinguished as *a priori* or *a posteriori*, when they proceed from cause to effect or from effect to cause; for the cause is naturally prior. If I know an effect,—a *fact* or thing done,—from seeing it done, I know it from what comes *last* in regard to that thing,—from its *ultimate* accomplishment. My knowledge is, therefore, *a posteriori*. On the other hand, if I know a fact *before* seeing it done, I know it from some source prior to the fact. My knowledge is, therefore, *a priori*.

The former kind of knowledge is often spoken of as *experience*. Now, experience is literally *trial*. When we observe a fact as it actually happens, we may be said to have found it out by trial; and, therefore, our knowledge of it is appropriately described as *experiential*, or by the Greek equivalent *empirical*.

Much of the knowledge, on which we act every day, is *a priori* in a certain sense. While I am writing, I have not yet tried the ink that is at the moment on my pen; but I know *a priori* that it will leave a permanent mark on paper. Still, this knowledge, which, *relatively* to these drops of ink, is *a priori*, is not *absolutely* so. It is based on knowledge previously acquired by experience,—by trying similar ink. As far as such cases are concerned, therefore, it remains a question, whether there is any knowledge that is absolutely *a priori*.

4. Various other terms are applied to *a priori* cognitions, describing the same characteristic from different points of view. (a) They are called *pure*, because they are derived from the intrinsic nature of intelligence, without the admixture of anything extraneous. (b) They are, therefore, to be viewed, not as

exotics transplanted into the mind from some foreign source; they are rather *native, innate* (inborn). (c) On that account, they must also be conceived to be at the origin of all cognition, to be *original*. (d) As essential to the possibility of cognition, they are further spoken of as *necessary*; and (e), being necessary to intelligence, they must be found in *all* minds, that is, they are *universal*.

5. Such cognitions, being common to all men, are sometimes described as together constituting the *Common Sense*. This expression was brought into special prominence in the literature of British philosophy by the Scottish School; and the student will find a learned justification of the term, along with much interesting information about other terms of kindred meaning, by the greatest representative of the school, Sir William Hamilton, in his edition of *Reid's Works*, Note A, § 5.

6. The distinction, drawn between Reason and Understanding, has some interest in the present connection. Both terms are often employed for intelligence in general, or at least, as already mentioned,* for the higher process of intelligence, namely, comparison. But along with this general meaning, Understanding is often used, in a special sense, to designate intelligence considered merely as constructing cognitions of an empirical and particular nature, while Reason is, in contrast, applied to intelligence as furnishing, by its own nature, those *a priori* principles which form the supreme categories, the highest unifications of all knowledge. The further explanation of this distinction, with the modifications which it has received from different writers, would lead, however, into controversies of a philosophical

* See above, Book i., Part ii., Chapter ii.

nature. It need only be added that, whatever distinctions of this kind may be recognised, they must not be conceived as breaking up the essential unity of self-conscious intelligence; for it is in virtue of this unity, that intelligence forms the supreme categories that give a structure to all experience.

We may now proceed to the examination of these categories.

§ 1.—*Self-Consciousness.*

The previous chapters have described the evolution of our knowledge through its various stages. From this description it appeared that the very earliest step in forming the simplest perception is the consciousness of a sensation. This means that the sensation is no longer a purely subjective state, in which the sentient being is himself absorbed; it must have become an object of knowledge, to be compared with others,—to be identified and discriminated. But this objectifying of a sensation implies that it is projected from me: in this act I become conscious of something which is not I; and the consciousness of that which is not I is the consciousness at the same time of myself. Self-consciousness, therefore, is involved in the very beginning of knowledge.

Accordingly, self-consciousness is not so much an essential factor of intelligence, as rather intelligence itself. It cannot, therefore, be a product of processes of intelligence, themselves products of non-intelligent forces: for processes of intelligence without self-consciousness would be processes of intelligence without intelligence; and the forces, producing processes of intelligence, would, though non-intelligent themselves, be intelligible,

and an intelligible system of forces pre-supposes an intelligence, to which it is related. Still, Empiricists have endeavoured to explain self-conscious intelligence as merely one among the innumerable products of the universal forces, which intelligence itself construes into intelligible system. It is, therefore, necessary to consider this theory. Recent expositions will be found in Mill's *Examination of Hamilton's Philosophy*, Chap. XII.; Bain's *Emotions and Will*, Note on Subject and Object at the end of the volume; Spencer's *Principles of Psychology*, Part VII., Chapters 16-17. The following statement contains the salient points of the theory, the language of Mr. Mill being generally adhered to as closely as possible.

We have no conception of mind itself; we neither know nor can imagine it, except as represented by the succession of feelings which are called states of mind. Nevertheless, our notion of mind is the notion of a permanent something, contrasted with the perpetual flux of mental states which we refer to it; but the something, which we thus figure as remaining the same while its states change, resolves itself into a permanent possibility of these states. This permanent possibility of feeling, which forms my notion of myself, is distinguished from those permanent possibilities of sensation, which form my notion of external objects. The latter are permanent possibilities of sensation only, while the former includes all kinds of feeling; and, what is more important, the former is a possibility to me alone, the latter to other beings as well. The distinction has also,—at least so Dr. Bain insists,—a certain correspondence with the distinction between the ideal and the actual, between imagination and reality.

To account for this notion of self it is postulated,

that the mind is capable of association and of expectation. By these principles the actual feelings of the present become associated with the once actual feelings of the past and with possible feelings expected in the future; and the aggregate thus formed is the something permanent amid changes of feeling,—the self which we figure as remaining the same while its manifestations vary.

This theory suggests some obvious criticisms.

I. Exception may surely be taken to the initial limitation of our knowledge of self. You may predicate what you like about stages of mental life prior to the origin of self knowledge, or of any other kind of knowledge, whether in the human infant, or in organisms of ruder type. You may assert that at these stages mental life is merely a succession of feelings which never refer themselves to any self who feels them. But the limitation, to which exception is taken, has nothing to do with such a stage of mind: it expressly applies to a self-conscious activity; and it asserts that, even when I do know myself, I know myself merely as a succession of feelings. So far am I from knowing myself always and only as a succession of feelings, that I never know nor can conceive myself as such. The assertion is, in fact, a contradiction in terms; it is tantamount to the assertion, that I know myself as that which is not I.

There is, indeed, a sense in which the assertion might be interpreted as an awkward expression of a truth. A feeling, considered as a concrete fact, is but a mind or self in a certain state. It is true that by the ordinary process of abstraction we may give special attention to the state of feeling without thinking specially of the self who feels, just as we may withdraw our attention from the centre of a circle and confine it specially to the cir-

cumference. But as the latter abstraction is never supposed to imply that a circle can be known only by its circumference and without any centre, surely the abstraction of feeling from the mind that feels cannot be understood to mean that the mind may be known only by its feelings without reference to itself. Whenever we descend from the dead abstractions of science to the living facts of our mental existence, it becomes obvious that feelings, thoughts, volitions are merely mind in its different activities and states. Accordingly, when it is asserted that we know the mind merely as a succession of feelings, the statement might be interpreted as implying nothing more than that, when I know myself, I must know myself, not as an unreal abstraction, but as a living reality—not as a mere indeterminate something, but as a being who knows and feels and wills.

This, however, is not what is meant by the limitation which the theory imposes on our knowledge of self. It assumes that we may know certain phenomena called feelings or mental states, but that we cannot know a being who feels, a mind that exists in these states. The truth is, that the whole description is based on the application to self-conscious intelligence of a wholly inapplicable category—the category of substance and quality. The self-conscious intelligence constructs, by processes which we have analysed, a world of things or substances distinguished by determining qualities. But the form, in which the world is thus construed by intelligence, cannot be reflected on the construing intelligence, as if itself were merely one of its own constructions.

Even the category, here applied, is misunderstood. It is used as if it implied that substance is an unknown and unknowable something, hid behind the impenetrable veil of its qualities. Without discussing here how far

this is a proper account of the category, it must be evident that, under such an interpretation, it has no applicability to self-consciousness. We may, indeed, if we choose, speak of the self as a secret that is inexplicable. But it is a very open secret. There is nothing that we can apprehend more clearly than the meaning of "I" and "me," when they are used simply to express selfhood. All that can be understood by speaking of the self as inexplicable is, that in self-consciousness we come upon a fact, beyond which science, knowledge, cannot go; for it is the fact of knowledge itself.

The truth is, that the attempt to restrict self-knowledge to a series of changing feelings is abandoned as soon as it is made. For after declaring that we cannot *know* or *conceive* or *imagine* the mind except as represented by a succession of feelings, Mr. Mill adds in the immediately following sentence, that our *notion* of mind is the notion of a permanent something. It is this notion whose origin the theory seeks to explain.

II. The explanation, however, will be found to involve throughout a begging of the question at issue.

1. The postulates assumed and their application will make this evident.

(a) The first of these postulates is association. Now, our analyses have shown that the effects of association are often marvellous; but, after all, it can merely associate. It can link together this, that, and the other feeling. It can, after a while, make one suggest another rapidly and uniformly, even instantaneously and irresistibly. But no mere association can create what is not contained in any of the associated states. These remain this, that, and the other feeling to the end. Certainly no multiplicity of feelings can, simply by the fact of their being associ-

ated in a continuous succession, produce the unity of self-consciousness.

(b) The other postulate, that the mind is capable of expectation, is still more obviously out of the question; for expectation is inconceivable without self-consciousness. The language employed by Mr. Mill in the statement of this postulate conceals the inconceivability. The assertion that "the mind is capable of expectation," is intelligible only on the supposition that the expecting mind is already self-conscious, is able to imagine itself feeling in the future. But it should not be forgotten, that, on this theory, the expecting mind, not being yet developed into self-consciousness, is at any moment merely a feeling or a cluster of co-existent feelings. Consequently, the postulate, expressed with strict regard to the conditions of the theory, should have been to the effect that a feeling or a cluster of feelings is capable of expecting other feelings in the future. It may fairly be presumed that in this form the postulate would have placed itself beyond the necessity of criticism.

2. The description of the mind as a permanent possibility of feeling is another point demanding consideration in this theory. The term *possibility* is, indeed, somewhat vague; but, in any sense, it can be taken only as an intensified abstraction of a term already sufficiently abstract, namely, *power*. Now, on any empirical theory, power, or (what is the same idea) cause, reduces itself, as we shall see,* to an uniform antecedence. But evidently this idea has no application in the present case. The only cause, power, or possibility, from which a mental state proceeds, is, for the empiricist, the state or cluster of states forming its antecedent. Empiricism

* See § 5 of this chapter.

cannot even entertain the conception, that, in addition to these determining antecedents, the self enters into the temporal current of feelings as a constant factor in their causation. And yet, on any other interpretation, it is difficult to comprehend what is meant by speaking of the mind as a permanent possibility of feeling.

The fact is, as already urged, that the categories, by which the self-conscious intelligence gives order to the succession of phenomena, are not the qualifications by which that intelligence is itself described. It is true that I, as an individual person, distinguish myself from other individuals by the particular current of feelings and thoughts which make up my mental life. But in the self-consciousness, which characterises that life, there is a principle implied, which cannot be conceived as itself a mere product in time of any temporal association of phenomena. It is but due to Mr. Mill to observe that he himself admits the intrinsic inconceivability of his theory. "The thread of consciousness," he says in closing the discussion, "which composes the mind's phenomenal life, consists not only of present sensations, but likewise, in part, of memories and expectations. Now what are these? In themselves, they are present feelings, states of present consciousness, and in that respect not distinguished from sensations. They all, moreover, resemble some given sensations or feelings, of which we have previously had experience. But they are attended with the peculiarity that each of them involves a belief in more than its own present existence. A sensation involves only this : but a remembrance of sensation, even if not referred to any particular date, involves the suggestion and belief that a sensation, of which it is a copy or representation, actually existed in the past : and an expectation involves the belief, more or less

positive, that a sensation or other feeling to which it directly refers will exist in the future. Nor can the phenomena involved in these two states of consciousness be adequately expressed without saying that the belief they include is, that I myself formerly had, or that I myself, and no other, shall hereafter have, the sensations remembered or expected. The fact believed is, that the sensations did actually form, or will hereafter form, part of the self-same series of states, or thread of consciousness, of which the remembrance or expectation of those sensations is the part now present. If, therefore, we speak of the Mind as a series of feelings, we are obliged to complete the statement by calling it a series of feelings which is aware of itself as past and future : and we are reduced to the alternative of believing that the Mind, or Ego, is something different from any series of feelings, or possibilities of them, or of accepting the paradox, that something which *ex hypothesi* is but a series of feelings, can be aware of itself as a series. . . . The true incomprehensibility perhaps is, that something which has ceased, or is not yet in existence, can still be, in a manner, present : that a series of feelings, the infinitely greater part of which is past or future, can be gathered up, as it were, into a single present conception, accompanied by a belief of reality. I think by far the wisest thing we can do is to accept the inexplicable fact, without any theory of how it takes place."

No one can fail to be impressed with the fairness of spirit, which characterises this exposition by Mr. Mill of the inconceivability attaching to his theory. The exposition implicitly contains most of the criticism which this section has passed upon the theory ; for it admits that self-consciousness cannot be conceived as constructed by an association of successive sensations. The full

purport of this admission the sequel of this chapter will show. It will then appear that, with the admission, empiricism in psychology is virtually abandoned.

The empirical theory of self-consciousness assumes, in the postulate of expectation, even if in no other respect, that the consciousness of time precedes the consciousness of self. We shall now consider the tenability of this assumption.

§ 2.—Time.

The consciousness of time is explained, on the empirical theory, as generated by the succession of conscious states. Probably the fullest exposition of the theory in recent times is that of Mr. Herbert Spencer.* His exposition may be summed up thus:—

I. In the consciousness of successive states one part of the fact of which we are conscious is their succession. The state A appears in consciousness, not as the isolated state A, but as prior to its consequent B. Again, B appears as posterior to A, and prior to some third state, C; and so on with the other factors of any conscious series.

II. Now, suppose, as often happens in actual consciousness, two states separated, first by a brief interval, say a second; afterwards by a longer interval, say a minute; and again by an interval longer still, such as an hour, a day, or a year. Here we have the *same* conscious states separated by *different* intervals. We are thus led

* *Principles of Psychology*, Part vi., Chapter xv. See also Sully's *Outlines of Psychology*, pp. 255—265.

to distinguish the intervals from the states they separate, —to form the *abstract idea of succession*, that is, of *time*. This abstraction may also be created, or, if already created, may be confirmed, by the fact, that *different* sets of conscious states may be separated by the *same* interval of time. Thus an odour and then a taste, a colour and then a sound, a sorrow and then a fit of anger, may follow one another, each at the interval of a second or an hour or a day or any other definite period.

The theory, thus sketched, explains, if such an explanation were necessary, how, *given* the consciousness of our feelings being related in time, we may separate the idea of time from the feelings; that is, it explains how, from the consciousness of feelings being successive, we may form the abstract idea of succession. But it does not begin to explain how we first become conscious of the concrete fact, that our feelings are not merely feelings, but are related as consecutive or as contemporaneous. For the proposition, with which the theory starts, is either untrue or an assumption of the point at issue. The proposition is untrue, if it be taken to mean that the fact of succession is a part of the successive feelings, of which we are conscious. I am conscious of one feeling, then of another; but in the one or the other there is nothing to tell that it comes before or after. Do I taste time, or smell it, or touch it with my fingertips, or see it in colours, or feel it when I am roused into anger or melted into tenderness?

But it may perhaps be urged that, though no feeling is itself a consciousness of time, yet the association and mutual suggestion of feelings form this consciousness. Need it be repeated that association can merely associate? It can give us a taste *and* an odour, a colour *and* a sound, etc.; and, if prolonged, it may produce an

irresistible and instantaneous suggestion. But the fact of one sensation being suggested by another, however irresistibly and instantaneously, is not the consciousness of their being related as prior and posterior; it is simply the consciousness of one sensation, then of another; it is not the consciousness of any relation whatever between them.

But in a certain sense it is true, that the fact of their succession is a part of the whole fact of which we are conscious in a series of feelings. Only the proposition is not true in the sense which the theory requires. The consciousness of their succession is a wholly different act from the consciousness involved in the successive feelings themselves. It implies that consciousness is not restricted to feelings, but goes beyond them, and compares them with one another. Now, how is such a consciousness possible? If our mental life be merely a succession of feelings, if the consciousness of each moment absolutely vanishes as that moment passes away, there can be no principle in consciousness to connect the different moments by a comparison which goes beyond each and cognises its relation of priority or posterity to others. For this there must be some permanent factor of consciousness,—a factor that is out of the succession which it observes. That factor is self-consciousness; and without self-consciousness the consciousness of time is thus seen to be impossible.

Thus also memory is explained. For memory is something more than mere suggestion, with which it seems at times to be confounded in a purely empirical psychology. By memory is meant, not merely the representation of a former presentation, called up by the Laws of Association. It is a representation accompanied by the consciousness that it *is* a representation of what was formerly present.

Memory therefore implies a higher function of the mind than a bare association. It is the higher function of comparison applied to the suggestions of the past. As perception is an interpretation by thought of the presentations arising in consciousness from the excitement of the sensibility at the time, so memory may be described as an interpretation of the representations suggested to consciousness by associations formed before. It is a *judgment* with regard to the time—the temporal circumstances—in which these representations were previously presented in consciousness. We can therefore understand why it is that, while suggestion is active in the earliest manifestations of mental life that we can trace, memory is a later development. Young children evidently often confound mere fictions of the fancy with valid reminiscences; and the poor creatures are sometimes ignorantly punished for lying, when their sole fault is a mistaken judgment with regard to a suggestion. Even in mature life most men must have had experience of the inconveniences arising from a slip of memory, which is no more unintelligible than an illusion of sense; and the scrupulous thinker will sometimes find himself in doubt as to whether his memory deceives him or not. When memory is thus fully described, it is seen to be impossible without self-consciousness. For if there were no permanent self, continuing identical amidst all the changes of consciousness,—if there were but a perpetually altering consciousness, in which each moment absolutely perishes as the next supervenes,—then there might perhaps be suggestion of one feeling by another, but there could be no memory. For memory is the consciousness that I, remembering in the present, am identical with my self of the past remembered. The inconceivability of memory on any empirical theory of mind is strikingly

expressed in the quotation from Mr. Mill near the close of last section.

§ 3.—*Space.*

The empirical theory on the origin of this notion starts from the position, that all ideas of space may be interpreted in terms of muscular sensibility and time. It may, therefore, be observed in passing that, on this theory, the idea of space pre-supposes that of time; so that it is possible to admit the empirical origin of the former, while denying that of the latter. To explain the fundamental position of the theory, it is to be observed that every notion of space may be described as referring to a possible series of muscular sensations in a given time. Is the particular notion that of magnitude? then suppose, for example, I am thinking that the desk before me is larger than the book lying on it, my thought implies that a longer or quicker series of muscular sensations would be experienced in passing the hand over the surface of the one than in passing it over that of the other. Again, is the particular notion that of distance? then suppose, by way of illustration, I perceive this house to be nearer than yonder mountain, my perception means that a longer or quicker series of muscular sensations would be felt in reaching the one than in reaching the other.

Starting from this interpretation of our notions of space, the empiricist proceeds to the fact that space implies more than a *succession* of sensations; it implies a *co-existence* of positions. I conceive that the points, successively occupied by my hand or my body in traversing a space, do not vanish out of existence, but continue to exist when my hand or my body has left

them. How is this additional notion to be explained? Partly by the fact, that we can feel simultaneous sensations of touch corresponding to the points successively touched during the series of muscular sensations experienced in traversing a tangible surface. Still more fully, however, is this notion of simultaneity developed by simultaneous sensations of sight, as these can compass a far vaster extent of surface. In fact, Mr. Mill at least holds that, without the aid of sight, in other words, to the congenitally blind, ideas of space can never imply more than a mere succession of muscular feelings. But perhaps the idea of points successively touched being co-existent would be most unequivocally suggested to the mind by our ability to repeat the series of touches in any order.

The different points, simultaneously discerned by touch and sight, or thought as co-existent by being touched in different orders, become thus the symbols of different stages in a series of muscular sensations by being associated with them. Finally, by abstraction these different points or positions may be dissociated in thought from the muscular sensations with which they were originally associated, and which they originally represented. We thus reach the abstract idea of co-existent positions, that is, of space. For space, as indicated especially by the German term *Raum*, is simply the room or sphere in which muscular exertion is possible.*

The opponents of the older empiricism have usually

* Expositions of this theory will be found, among other places, in Mill's *Examination of Hamilton's Philosophy*, Chapter xiii.; Bain's *Senses and Intellect*, Part ii., Chapter i., §§ 33-45; Spencer's *Principles of Psychology*, Part vi., Chapter xiv., with which compare Chapter xxii.

contended that its genesis of this notion assumes implicitly the existence of the notion before the process of origination begins. The more recent empiricists, however, ascribe the imperfection of the old empirical theory to the fact that it failed to recognise the function of the muscular sense in the development of this notion. But it is difficult to see how the introduction of this new factor into the development evades the old charge. For in educating the notion of space from muscular sensations, it must not be supposed that these are anything but sensations. They are, of course, distinguishable in consciousness from other sensations—from tastes, sounds, colours—as these are from one another. Different muscular sensations also are distinguishable from one another in intensity, in duration, and in other respects; but still they are only sensations.

Now, the problem is to explain how such sensations become objective relations—of distance, magnitude, situation—between things. In solving this problem we must not describe these sensations as if they were already such objective relations. But descriptions of this purport seem hardly avoidable. Some muscular sensations, for example, are spoken of, and with propriety, as “sensations of movement.” Yet this language is apt to be used as implying that a muscular sensation is a consciousness of movement, and therefore of the space through which the moving body passes; but this consciousness is not really involved in muscular sensations, or in any other sensations as such. Occasionally in the discussion of this subject phrases are employed with less justification, as when “consciousness of position,” or “position” simply, is made to stand as an equivalent for any sensation of touch.

In such descriptions of sensations the whole question is apt to be begged. A sensation cannot take us beyond itself; and that is necessary in order to conceive a relation of space or of any other sort. Here again, therefore, empiricism falls into its general confusion between sensations, whether isolated or associated, and the act of self-conscious thought by which sensations are compared. But, in addition to this general confusion, the empirical theory on the notion of space falls into the special mistake of confounding the sensations associated with a notion and the notion itself—the sensations of muscular exercise and the notion of space. It is quite true that we can interpret space in terms of muscular sensation and time; for muscular sensations are associated with our notion of space: but they do not generate or constitute that notion. In the first chapter of this Part it was shown that solidity, distance, and other relations of space become associated with visual sensations, and therefore irresistibly suggested by them. In like manner they are associable with, and suggestible by, muscular sensations. But before we have obtained any notions of space at all, it would of course be meaningless to speak of them as being associated with muscular or visual or any other sensations.

To say that the notion of space *is* merely the notion of a possible series of muscular sensations, is to beg the whole question. The feeling excited by the movement of a muscle is not the consciousness of a muscle moving. How do I know that muscular feeling implies masses of muscle which fill space, and a space in which these masses may move? Not from sensations, either isolated or associated. For space is not feeling; it is not a subjective state, or an association of subjective states. It is

a relation of objects ; and, as a relation, it can be known only by comparison.

Once obtained, the notion of space may become associated, and that inseparably, with sensations. With what sensations? It is hard to answer definitely, if we mean the sensations with which *alone* the notion associates. But it seems as if the organs of touch and sight, by the sub-division of their terminal fibres, were peculiarly adapted for suggesting that reciprocal outness, which constitutes spatial relation.

Once a sensation is associated with locality, the inseparableness of the association, and the irresistibility of the consequent suggestion, are remarkable. The loss of an arm or leg might be expected to break the association, and to arrest the suggestion of these parts of the organism ; but when any irritation is set up in the trunk of a nerve which formerly extended to a lost limb, the irritation continues to be felt as if at the former termination of the nerve. What is still more astonishing, the same suggestion is observed even in cases of congenital imperfection. For instance, a girl of nineteen years, in whom all the metacarpal bones of the left hand were very short, and the bones of all the phalanges on that hand entirely wanting, used to experience sensations that seemed to be in the palm and fingers of a hand that never existed, as well as in the right hand which she had.*

Some other problems with regard to space and time will be more appropriately discussed at the close of next section.

* Some notice of such cases will be found in M'Cosh's *Defence of Fundamental Truth*, p. 164. Dr. M'Cosh quotes the *Repertorium für Anatomie und Physiologie* for 1836, p. 330.

§ 4.—*Substance.*

The cosmos, that is unfolded to self-conscious intelligence, is a world of *things, objects, substances*. It is this aspect of the world of consciousness, that now demands consideration.

The empirical theory on the notion of substance has not advanced since the time of Locke. A number of simple ideas, Locke explains, are found to occur together; in more modern language we should say, that a number of sensations are uniformly associated in our experience. On the ground of this association, we become accustomed to think of them as connected by some real bond, this habit being confirmed by the fact that such aggregates of simple ideas or sensations are commonly distinguished by a single name.*

Here again the empiricist must be reminded that association simply associates. One sensation may, by uniform association, be made to suggest others, even instantaneously and irresistibly; but that is not the idea of substance. For in any number of sensations, however long associated and however powerfully suggestive of each other, we have not yet got an objective world at all. This is apt to be concealed by the imperfection and ambiguity of Locke's language, in which "sensation" and "idea of a quality" are confounded. But sensations are the states of a subject, and contain in themselves no reference to an object. Tastes, touches, colours are merely tastes, touches, colours; they are not the consciousness of a thing sapid, tangible, coloured. Whenever we describe them as *qualities* or *ideas of qualities* we assume the point at issue,—we take for granted the existence of the notion of a substance to which they belong; for *quality* has no meaning apart from a thing qualified.

* See Locke's *Essay*, Book ii., Chap. 23.

It is a striking proof of the impossibility of eliciting this idea from sensations, that Hume, on the empirical principles of Locke, denies not only the objective validity of the idea, but even its very existence, on the ground that there is no sensation,* from which it could be derived. The empiricists of the present day generally accept Hume's doctrine, but proceed in defiance of it by starting from an object outside of consciousness,—a substance or force,—as the generator of consciousness itself.

If we cannot trace the notion of substance to sensations, its origin must be sought in some other factor of consciousness. To do this, let us observe the import of the notion. We are accustomed, as Locke puts it, to suppose that the qualities, represented by our simple ideas, are connected by some bond. Even Hume acknowledges, that "they are commonly referred to an unknown *something*, in which they are supposed to inhere; or granting this fiction does not take place, are at least supposed to be closely and inseparably connected by the relations of contiguity and causation." That is to say, that the world, which unrolls itself before conscious intelligence, is conceived not as a series of vanishing sensations, but as a system of things which, with all their variableness, are endowed with a certain permanence. How comes it that the world shapes itself thus to intelligence? It arises from the fact, that otherwise there would be no intelligible world at all; it is therefore the form of the world, that is implied in the very nature of intelligence. For to be intelligent is to be self conscious; and to be conscious of self is to be conscious of notself. Consequently, the very act of

* *Impression* is Hume's name for sensation. See Hume's *Treatise of Human Nature*, Book i., Part i., Section 6.

intelligence, by which we are conscious of sensations, projects these into an objective sphere, transmuting them into qualities of objects, and thus forming out of them a world that is not ourselves.

Accordingly, in their psychological aspect at least, qualities are simply the form in which self-conscious intelligence construes sensations. By a similar construction is formed the notion of substance as that unity by which qualities are essentially connected, and which remains unaltered amid their changes. For the variable elements—the qualities—of things in the world of consciousness can be conceived, even as variable, only by relation to that which is permanent. The very conditions, under which alone an intelligible universe can be conceived, render necessary the notion of substances as enduring while their qualities change.

And here perhaps we find also the source of those two supreme forms under which the objective world is conceived—the world of objects co-existing in space, and undergoing successive modifications in time. For the world takes its intelligible form from its being posited, by intelligence that is conscious of self, as something that is not self. Now,

1. The notself cannot be thought as an absolute identity. It is the opposite of the identical factor of consciousness; it is a construction of factors which are necessarily thought as varying, *i.e.*, as in time.

2. Neither can the notself be thought as an absolute unity. Whatever relative unity may be ascribed to it, it must still, as opposed to the absolutely simple factor of consciousness, be thought as essentially manifold. That is merely another way of saying that it must be thought not as one indivisible whole, but as composed of distinct parts—of parts that are mutually exclusive. But the

relation of mutual externality between co-existent things is space.

Space and time would thus appear to be forms in which the world must necessarily be conceived in order to be intelligible—in order to be an object to self-conscious intelligence. This view of these forms takes away the ground from the puzzles which have been often built upon them since the time of the Eleatic Zeno. It has been often maintained, even in recent times, that human intelligence is the helpless victim of a mysterious antinomy or contradiction in applying the notions of space and time; and from this alleged fact various metaphysical inferences have been drawn with regard to the intrinsic impotence and limitation of our intelligence. This is not the place to enter upon the metaphysical aspects of the problems involved in this doctrine, but in so far as the doctrine bears upon the notions of space and time as psychological phenomena, a few words of explanation are required.

The doctrine in question asserts that it is impossible to conceive time and space as, on the one hand, unconditionally infinite or unconditionally finite, as, on the other hand, infinitely divisible or absolutely indivisible. However far you may stretch the imagination into the regions of space, into the past or the future of time, you cannot touch in thought an absolute limit—a limit beyond which there can be conceived to be no space or time. Repelled from the conception of such a limit, you endeavour to conceive space or time as absolutely unlimited; but you find that thought sinks exhausted in the effort to compass this conception. Again, if time and space are broken up into parts, it is found impossible, on the one hand, to imagine a portion of either so small that it cannot be divided into portions smaller still,

on the other hand, to carry any portion of time or space to an infinite division in thought.*

Notwithstanding the high authority under which these perplexities have been propounded, it does seem that they imply a misapprehension regarding the nature of the notions upon which they play. It is quite true that we cannot think an absolute limit to space or time, while we are equally unable to think of them as absolutely unlimited. But the reason of this is to be sought in no mysterious impotence, which restricts in a special manner the finite intellect of man. The impotence arises from the fundamental condition of all thinking—the law which prevents thought from contradicting, and thereby removing, its own positions. For space and time are, as we have seen, forms of relation; and to ask us to conceive them under those modes, which the doctrine in question pronounces inconceivable, would be to require the conception of a relative which is not related to anything.

Take, by way of illustration, the idea of a space absolutely limited. Space is a relation of mutual outness; the very idea of space implies that every space has something outside of it. But a space with an absolute limit would be a space, to which there is nothing outside, —a space that is not a space at all. So, time means a relation to a before and an after. An absolute limit to the past, therefore, would be a time with no before; an absolute limit to the future, a time with no after. But either limit would be a time that is not a time.

* See Kant's *Kritik of Pure Reason* (Chapter on the Antinomy of Pure Reason); Sir William Hamilton's *Discussions*, pp. 13-15, 601-9; *Lectures on Metaphysics*, Vol. ii., pp. 367-374. Compare Mansel's *Limits of Religious Thought*, Lecture ii., and Spencer's *Part i., Chapter iv.*

Take, again, the opposite extreme of the infinite. An infinite space or time, as the writers on the subject explain, is a conception that could be formed only by the infinite addition in thought of finite spaces and times; in other words, the conception implies an endless process. But when I am asked to form the conception now, I am asked to think a contradiction; I am asked to end a process of thought which by hypothesis is endless.

The same remark applies to the infinite division of space and time; for like an infinite addition, an infinite division is a process which it would be a contradiction to speak of completing. On the other hand, space and time are, by their very nature as relations, conceived to be made up of related parts. The conception, therefore, of a space or time absolutely indivisible would involve an inherent contradiction.

§ 5.—*Cause.*

After the preceding analyses, especially that of last section, little remains to be said on the special problem which the notion of cause presents. There is evidently a close affinity between the notion of cause and that of substance: in some metaphysical analyses substance and cause are regarded as ultimately identical. As far as they form distinct notions, the one refers to a necessary or objective connection of co-existing phenomena, the other to a similar connection of phenomena that are consecutive, in the world of which we are conscious. Accordingly, as empiricism derives the notion of substance from the uniform association of co-existing sensations, so it analyses the notion of cause

into an uniform association of sensations that form a sequence.

This analysis is obviously chargeable with the general vice of all empiricism : it gives us a world merely of associated sensations, not of connected objects. A fortuitous association of sensations, however frequently repeated, is not a necessary connection of objects ; a temporal association in our consciousness is not an objective connection between the things of which we are conscious. There need be no reluctance to admit, to the fullest extent, the marvellous effects of association, especially when uniform and frequent. We have seen that the two factors of an uniform sequence may, after a while, be able to suggest one another irresistibly and instantaneously. Still this implies merely that first the one appears in consciousness, and then the other immediately and inevitably arises. But the thought that the two are essentially connected, so that the one cannot appear without the other—this is a new thought, wholly different from either or both of the terms in the sequence.

This thought, again, is the thought of a relation or connection, and cannot therefore be identified with sensation. It implies a consciousness which goes beyond transient sensations and connects them with each other by a comparing act. This act is rendered possible by the presence in consciousness of a permanent factor that is not itself merely one of the phenomena which flow in unceasing variation. It is this factor by which, as we have seen, a plurality of co-existent qualities are connected into the unity of a substance. The same factor connects the successive movements in the world that rolls before consciousness. The changing modifications of substances, which constitute this succession, are thus thought as intrinsically connected in their temporal

relations—as coming necessarily before and after one another. But to say that one is necessarily prior, and another necessarily posterior is to say that the one is cause and the other effect.

PART II.

FEELINGS.

Introduction.

IN the remarks at the beginning of this Book it was explained, that the various functions of mental life are evolved from the raw materials of sensation by the twofold process of association and comparison; and the student may with advantage here refer to the explanatory remarks on this subject. The development of the first function,—that of cognition,—has been illustrated at length in Part I. It is the development of the second function, that we have now to trace. This function is variously termed *feeling*, *emotion*, *sentiment*. The term *affection*, as we shall afterwards find, has been commonly restricted to a single class of feelings, while *passion* is, in ordinary usage, applied to any feeling of unusual intensity. Of the three terms properly descriptive of these phenomena, *emotion* has the advantage of possessing the cognate adjectival form *emotional*: the adjective *sentimental* is not available for the same purpose, as it implies, in popular use, a preponderance of the emotional over the intellectual factor in our mental constitution.

The various forms of feeling have their origin in the

fact, that sensations are sources, not only of knowledge, but also of pleasure and pain. In the analysis, upon which we are entering, it will appear that the capacity of the different sensations for developing emotion, like their capacity for developing cognition, is to be measured by their associability and comparability. The most complex emotions, therefore, are those which draw their materials mainly from the more intellectual senses of hearing and sight. Those are also the emotions which are sometimes described as the most refined, inasmuch as in them the consciousness is freed from the dominion of mere sense, and exalted into a state in which purely mental activity becomes predominant over bodily sensation.

We have seen that the aspect of sensations, in which they form the source of our emotional life, is that in which they are regarded as giving pleasure and pain. Consequently, this aspect of sensation demands our attention at the outset. Further, it may be observed that, though emotions are not connected with bodily organs in the same manner as sensations, yet there is an important connection, on the ground of which certain states or movements of bodily organs have come to be accepted as expressions of emotion. It will be advisable, therefore, before entering on the detailed analyses of this Part, to discuss the two general subjects thus indicated, namely, the nature of pleasure and pain, and the expression of the emotions.

§ 1.—*The Nature of Pleasure and Pain.*

In this inquiry it need scarcely be said that the question does not concern the intrinsic nature of pleasure and pain as facts of consciousness. To be

known they must be felt ; and you can explain what they are in themselves only in the way in which any simple sensation—a taste, a colour, or a sound—may be explained, by referring to the fact in consciousness. The inquiry, therefore, is of the same nature with other inquiries which have been already instituted with regard to our sensations ; it concerns the conditions under which pleasure and pain arise in consciousness. Here, however, we are at once struck by a difference between our present inquiry and those which have been already carried out in reference to sensations. It was found that the quality, and even the intensity, of sensations are directly referable to conditions in their objective causes. On the other hand, the pleasantness or painfulness of a sensation is not in general obviously connected with a specific condition in the object, on which it depends. Accordingly, the conditions, which determine the pleasurable or painful character of any conscious state, are to be sought, not in the object with which it is associated, but rather in the subject itself. On this fact is founded the ethical doctrine, preached by Epicurean and Stoic alike, regarding the indifference of externals to the real happiness of human life. This fact is also expressed in the psychological doctrine, which describes feelings of pleasure and pain as purely subjective states. For while in knowledge and volition there is necessarily a reference to an object known or willed, in the mere feeling of being pleased or pained, the subject is occupied solely with his own conscious condition.

What, then, is it that makes one state of consciousness pleasant, and another painful ? This question seems to have attracted scientific attention for the first time under the great impulse, given by Socrates and by his contemporary adherents and opponents, to speculation on the

chief good of human life. Probably the earliest theory on the subject was that of the Cyrenaics, one of the various schools into which the many-coloured followers of Socrates separated immediately after his death. The theory, in its germ at least, may perhaps be traced to the Master; for it apparently received the sanction of his greatest disciple in the Platonic dialogue, *Philebus*. But a theory, taking a far larger grasp of the phenomena, was soon after elaborated by Aristotle; and it is marvellous to what an extent subsequent speculation on the subject has been influenced by Aristotelian thought. Sir William Hamilton has done more than any other British psychologist to draw attention to the subject, and his own theory professes to be little more than a reproduction of the Aristotelian. But the most recent discussions on the subject, even among the expositors of the psychology of evolutionism, follow the essential line of the same theory, happily enriching it with a new wealth of illustration from the vast range of modern biological science.*

Stript of the technical and even scholastic language in which it has sometimes been unnecessarily dressed,

* The completest exposition of Aristotle's own theory is in the *Nicomachean Ethics*, Book x. Sir W. Hamilton devotes to the subject the last six of his *Lectures on Metaphysics* (Compare my *Outline of Sir W. Hamilton's Philosophy*, pp. 195-222). Mill's *Examination of Hamilton's Philosophy* contains a chapter (the twenty-fifth) of hostile criticism on the theory. In Dallas' *The Gay Science* (Chapters 10-13) will be found an exposition of the theory with charming originality of illustration, and a chivalrous championship of Hamilton against Mill's attack. Among recent discussions by evolutionists, the chief work to be consulted is, of course, Spencer's *Principles of Psychology*, Part ii., Chapter ix., with which compare his *Data of Ethics*, Chapter x.; but a

the theory may be summarised in the following brief statement :—

All our conscious states—our activities and passivities equally—are capable of various degrees both of intensity and of duration. Still they are limited and that in two ways. There is firstly, an *absolute* or *ultimate* limit to the intensity and duration of any state,—a limit which cannot by any exertion be overstepped. There is, besides, a *natural* or *ordinary* limit, that is, a limit which the mental state tends spontaneously to reach, but which may be exceeded by an extraordinary exertion. This limit may be defined in various ways. It is here spoken of as natural, because it is the limit to which a mental state tends by its very nature. As affording a norm or rule for moderating the ordinary stimulation of a mental state, it may be called the normal limit. It is also the limit of health : if it is not usually reached, the organ or power called into play becomes atrophied ; if it is usually transgressed, hypertrophy and destructive waste ensue. Pleasure, then, may be defined as the consciousness arising from the stimulation of a mental state to its normal limit, and no further ; pain, as the consciousness arising from a mental state being strained beyond, or restrained within, that limit.

According to this law, therefore, those actions give pleasure which fulfil the conditions of healthy life, those, on the contrary, give pain, in which these conditions are violated. Accordingly, it has been pointed out by recent evolutionists that this is precisely the course

prominent place must be accorded to Mr. Grant Allen's *Physiological Aesthetics*, especially Chapter ii. A history of theories is given by Hamilton, and also by Wundt (*Physiologische Psychologie*, Vol. i., pp. 494-9).

which the development of life would take through a struggle for existence in which the fittest survive, as it has been held from of old that the arrangement is a beneficent provision which the wise Author of Nature has made for the preservation of the individual and the continuance of the species.*

But the abstract statement of this theory of pleasure and pain calls for some explanatory remarks in order to understand its interpretation of our emotional life. It may, therefore, be considered proper at the outset to notice an objection which appears in Mr. Mill's criticism of the theory. The objection is urged in an observation made by Sir W. Hamilton himself. "When," he says, "it is required of us to explain particularly and in detail, why the rose, for example, produces this sensation of smell, assafoetida that other, and so forth, and in what peculiar action does the perfect or pleasurable, and the imperfect or painful, activity of an organ consist, we must at once profess our ignorance." Mr. Mill cites this confession as implying that Hamilton was himself "more than half aware" of his theory being unable to fit all the facts. But, in spite of Mill's demand, Hamilton's assertion holds good with regard to all theories, that "in general we may account for much; in detail we can rarely account for anything." There is not an animal or plant, not a star in space or a pebble on the seashore, whose position and shape and properties we are able to explain in complete detail. The utmost we can do is to show how, if we were acquainted with

* It may be interesting to compare with Spencer's *Data of Ethics* Ferguson's *Principles of Moral and Political Science*, Part ii., Chapter i., § 6.

the history of each individual object, every detail in reference to it might admit of being explained ; but to show how each detail has actually been brought about, is beyond the power of the most industrious intellect. This inability, however, does not militate against our extending to unknown facts a theory which furnishes a simple explanation of all the known facts of the same class. From the accidental limitations of human knowledge, we may be unable to explain how certain facts have been, in all their minutest details, the result of a certain law : our ignorance does not imply that we know the facts to be incompatible with the law. Now, it is true that, in many cases, we cannot tell how the pleasantness or unpleasantness of a particular mental state has actually been produced. It is sufficient to be able to show how, if we were fully acquainted with the process at work in such mental states, their pleasant or painful nature would be seen to flow from the general law of pleasure and pain.

But this is precisely what we are able to do in reference even to our simple sensations. Take, by way of example, an unpleasantly sour taste. We know the destructive action of powerful acids on all animal tissues even of the toughest sort. Is it an illegitimate supposition that milder acids, like those of unripe fruit, which do not actually disintegrate the gustative organs, but merely produce an unpleasant taste, set up a violent activity in these organs, and that this excessive strain is the cause of the painful sensation ? For we know that an activity of the same kind, but more moderate in degree, such as is excited by the delicate acids of many common fruits, when ripe, is capable of affording one of the most pleasant tastes. On the other hand, it is worth observing that, if an acid of this sort is extremely diluted,

It is apt to excite that unsatisfactory feeling which appears due to an imperfect stimulation; and in such circumstances the sapid body is appropriately spoken of as insipid or tasteless. But it is evident that the full explanation of such phenomena must wait upon the progress of physiology in disclosing the nature of the organic processes concerned in our various sensations.

But whatever judgment may be passed on Mr. Mill's criticism, there are evidently not a few facts connected with our emotional life, which receive an interesting interpretation in the light of this theory. Among these prominence may be given to a fact which has often been noticed, that, on the one hand, feelings which seem intrinsically painful sometimes give pleasure, while, on the other hand, feelings which seem intrinsically pleasant sometimes give pain. To explain, it may be observed that some feelings appear to depend for their pleasurable or painful character on their intrinsic qualities. This is the case, as Wundt points out,* especially with those sensations, in which, as in tastes, odours, and the feelings of organic life, the consciousness is mainly taken up with the pleasure or pain received. Thus in distinguishing tastes of a sweet quality from those of a bitter quality, we commonly attach an intrinsic agreeableness to the former, an intrinsic disagreeableness to the latter. So, as already observed, smells are in general distinguished only by their agreeable and disagreeable qualities. In like manner, certain emotions, such as love and hope, seem to be intrinsically delightful, while others, like fear and hate, seem intrinsically painful. Now, if it were really the natural quality of a feeling

* *Physiologische Psychologie*, Vol. i., pp. 470-1 (2nd ed.).

which yielded its pleasure or its pain, it would involve an irreconcilable contradiction to speak of a painful feeling giving pleasure, or a pleasant feeling giving pain.

But the truth is indicated by our theory: it is not the essential quality of any conscious state that makes it agreeable or disagreeable, but its accordance or discordance with the limit of healthy exercise. This will appear from both sides of the fact under consideration.

I. The transition of generally painful feelings into an agreeable state is experienced where it might be least expected,—in sensation, where it might be supposed that, as there is a physical basis for the pain, there must be a physical barrier against its yielding to an opposite feeling. Yet we know that beverages and viands, disagreeable at first, come to be indulged in with even a greedy relish. Habits, like smoking, snuffing, chewing tobacco, are sometimes practised by the beginner with positive disgust, but become after a while the sources of a fascinating pleasure. It seems as if in these and kindred sensations the limit of healthy, and therefore of agreeable, stimulation were very near the limit where consciousness begins; and, consequently, even a faint stimulation is apt to overstep the limit of pleasure. But a persistent exercise of the organ, on which the stimulant acts, seems to produce such a modification of its structure, to impart such a strength or toughness to its tissues, as enables it to stand a degree of excitement which would previously have been unendurable. This is confirmed by the familiar fact, that the longer such a habit is indulged, and the more excessive the indulgence, the greater is the quantity of stimulus required to yield the gratification craved,—

“As if increase of appetite had grown
By what it fed on.”

It is but an extension of this explanation to suppose, that emotions, like grief and fear, which are apparently painful in their very nature, are so in reality only because they scarcely admit of any indulgence without transgressing the limits of healthy action. Feelings of the irascible type, for example, in all their ordinary outbursts, imply too violent a disturbance of our sensitive nature to be capable of yielding any pure enjoyment; and yet the proverbial sweetness of revenge is a proof that these passions do form the source of a strong gratification. Moreover, prolonged or excessive indulgence produces here the same effect as in the case of the unpleasant sensations which are converted into pleasure; the man, who continues to find delight in the indulgence of malicious feelings, may be hardened into a coarse insensibility to human sympathies, that will lead him to seek his hideous gratification in strong stimulants of envy and spite and cruel revenge, from which ordinary minds shrink with horror.

But we need not dwell further on the malevolent side of human nature, as it will require to be considered fully in the sequel, when the source of its gratifications may be more appropriately examined. In the instances which have just been described, feelings that are usually painful are made to give pleasure by raising the normal limit of healthy excitement, and thus enabling the mind to bear a more powerful stimulant. But there are instances in which the same result is reached in another way,—by lowering the intensity of the stimulation. An example of these is furnished by one of the main branches of literature. Tragedy plays upon the painful emotions of the human soul. These emotions, when aroused by causes in the world of reality, commonly imply an excitement too serious for any sort

of pleasure. They may, indeed, as we have seen, afford a gratification to coarse natures that crave strong emotional stimulants, or to morbid sensibilities that feed on excitement. But to most minds that seek recreation in literature the tragedy of real life is too shocking. An ideal representation of life's tragedies, however, excites the appropriate sentiments in such a moderate degree as involves no unwholesome strain upon our sensibility, and fulfils thereby the condition of pleasurable indulgence. These remarks are not, of course, intended to be understood as discovering the source of all the enjoyment that is derived from tragic literature. It is obvious, for example, that part of this enjoyment must be due to the æsthetic gratification afforded by literary art. But greater than all the mere delight in artistic workmanship is the pleasurable excitement which is felt in the emotions themselves that are aroused by the ideal pictures of tragedy; and it is a significant fact that philosophical critics, without any design of establishing a psychological theory, have yet sometimes analysed the pleasure felt in tragedy as if they were expressly illustrating the theory of pleasure and pain, which is now under consideration.* A further result of this theory is the rule of poetic art which demands that a tragedy shall not be excessive, or at least without relief; and it becomes a fair question of criticism, whether some great poems, such as even *King Lear* and *Othello*, do not transgress the limits which are required for poetic effect.

The emotions, which, since the time of Aristotle, have been regarded as pre-eminently the materials of

* See Hume's well-known essay *On Tragedy* (*Essays*, Part i., 22.). The quotation from Fontenelle is especially interesting.

tragedy, are pity and terror, or, as they might perhaps be more accurately described, sympathy with grief and sympathy with fear.* Yet grief and fear are, of all emotions, precisely those which force us, amid the realities of life, to face suffering without disguise. There is nothing, however, better established in experience than the fact, that these very emotions are capable of being transformed into pleasurable excitements.

1. Take, for example, fear. Even when it is not without ground in real danger, it is yet capable of being toned down so as to yield a genuine, though strong enjoyment, to men at least of robust nerve. It has often been observed that not a few sports owe their joyous stimulation in no slight measure to the excitement of the genuine peril which they involve. The ascent in a balloon, the shooting of a rapid in a canoe, the hunt of the tiger and other beasts of prey, perhaps even the glory of a battle-charge,

"And that stern joy which warriors feel
In foemen worthy of their steel,"

are instances in which even a well-grounded fear does not surpass the limit of pleasure when the sensibility has the toughness of vigorous health. But the purest pleasure of this stimulant is felt when it is drawn from imaginary sources; and it is not merely the drama, but other forms of literature as well, that take advantage of its power. Here, therefore, is disclosed the secret of the spell which poet or story-teller may weave from tales of

* See some capital remarks on this point in Dallas' *The Gay Science*, Vol. ii., pp. 53-59.

horror, and from all the weird imagery that clothes the mysterious agents of an antique superstition.

2. A similar fact is noticeable in the case of the other tragic emotion. It has often been observed that, after the first shock of a bereavement is over, the heart seems to become accustomed to the natural feeling of sorrow, yearns even after the indulgence, and finds a solace in the sad exercise. Sir William Hamilton has cited numerous references to this strange experience of sorrowing minds ;* but he has apparently overlooked the most exquisite expression that it has ever found, when Queen Constance, justifying herself against Philip's complaint that she had become "as fond of grief as of her child," pleads :—

" Grief fills the room up of my absent child,
Lies in his bed, walks up and down with me,
Puts on his pretty looks, repeats his words,
Remembers me of all his gracious parts,
Stuffs out his vacant garments with his form,
Then have I reason to be fond of grief."†

If, even in the real calamities of life, the heart may thus find pleasure in dallying with its own woe, it is not surprising that literature should seize upon a fact so favourable to its effects. Not only, therefore, does the agreeable stimulation of grief form one of the principal charms of tragic representation in the drama, as well as in the narratives of history and fiction ; but in all poetry still the favourite theme is *Il Penseroso*,—

The sweetest songs are those that tell of saddest thought."

* *Lectures on Metaphysics*, Vol. ii., pp. 482-3.

† *King John*, Act iii., Scene 4.

It need scarcely be added that, while for convenience illustrations have been drawn from literature, the same principle must explain the charm of pathos in all the arts.

II. But the counterpart of the fact we have been considering affords an equally remarkable illustration of the law, on which pleasure and pain depend. Feelings, that seem in their essential nature pleasant, may be rendered painful by depression or by excess. This, too, is experienced, even in the case of sensations, where it might be supposed that there is a physical necessity for the pleasure. The experience is extremely familiar in connexion with the manifold forms of physical enjoyment, which the strong and healthy find in muscular exercise: the moment the limit of health is passed, the moment an injurious waste sets in, that moment a warning is sounded in consciousness by the pleasure of exertion giving place to the pain of fatigue. But the same result is observed also in the indulgence of the passive sensations. Every child soon learns, by some uncomfortable experience,

“To loathe the taste of sweetness, whereof little
More than a little is by much too much.”*

There is a point, also, which the most delicious fragrance may not exceed; a slight increase in its intensity may transform it into a nuisance. But here it is surely unnecessary to enter into details; all that has ever been written on the disagreeableness of surfeits might be cited in illustration of the same truth.

In sensations, like those mentioned, which seem

* Shakespeare's *King Henry IV.*, Part i., Act iii., Scene 2.

intrinsically pleasant, it must be supposed that the limit of healthy activity for the sentient organ is considerably above the verge of consciousness, and that therefore the sensation in all ordinary degrees is a source of pleasure. But it is evident that the pleasure arises from no inherent quality of the sensation: it arises from the healthy moderation of the exercise which it involves, and is therefore neutralised by excess.

Familiar facts oblige us to extend the same law to our emotions. The experience of men under all conditions has been, that no cup of joy can ever be safely drained to the very dregs. Every attempt to charge our pleasures with an undue intensity, or to prolong them for an undue length of time, is inevitably frustrated by the irreversible laws of our nature. And, therefore, even when life thrills with a moment of ecstatic joy, there often shoots through consciousness a pang from feeling that the intensity of bliss cannot be sustained, that we are trembling on the verge, where a breath may decide whether pleasure or pain is to prevail. This fact has, indeed, opened an inexhaustible theme for the moralist in all ages, founding, as it does, on an unassailable basis the injunction to moderation in all our enjoyments. In an often-quoted passage from *Romeo and Juliet* this moral precept is actually based on the psychological law with which it is here connected; and the law is itself illustrated by reference to the very phenomena already noticed of pleasant sensations becoming in excess disagreeable.

“ These violent delights have violent ends,
And in their triumph die, like fire and powder,
Which as they kiss, consume. The sweetest honey
Is loathesome in its own deliciousness,
And in the taste confounds the appetite

Therefore love moderately ; long love doth so :
Too swift arrives as tardy as to slow." *

Beside the double fact, now illustrated, of pains becoming pleasant, and pleasures painful, there is another feature of our emotional life, which also receives explanation from the law of pleasure and pain. The law leads us to expect that pain may be produced by opposite causes,—by defective exercise as well as by excess. This expectation seems in many cases to be realised. In illustrating the statement that a taste of sour quality is not intrinsically disagreeable, it was pointed out that, when of moderate strength, as in the delicate acids of many fruits, sourness is rather agreeable, and that it becomes disagreeable either by excess, as in the strong acids of unripe fruits, or by defect, as in an insipid dilution. The same observation may be made in reference to sweet tastes, only that the limit of agreeable intensity is higher than in the taste of acids. The contrast between pains of excess and those of defect is not so obtrusive in other sensations ; yet here and there it may be traced. Thus, an aromatic substance like the odoriferous fruits, may, in course of putrefaction, become so strongly scented as to be offensive, while it excites a milder dissatisfaction also when its aroma is gone. In colour-decorations an excessive display of the powerfully stimulating tints at the red end of the spectrum may

* Act ii., Scene i. Compare the apposite passage in Goldsmith's *Deserted Village* :—

" In these, ere triflers half their wish obtain,
The toiling pleasure sickens into pain ;
And, e'en when fashion's brightest arts decoy,
The heart distrusting asks, if this be joy ? "

derive its disagreeableness, partly if not wholly, from the surfeit of the eye, while a superabundance of the milder greens and blues, and, still more, of neutral tints, may owe its unpleasant effect to the disappointment arising from imperfect stimulation. Most of these forms of unsatisfying sensations are without names, probably from the fact that they are not sufficiently obtrusive in human life to require specific mention often; but it is one of the earliest lessons of all science to learn that the variety of nature is not to be restricted by the imperfections of human language. Here, fortunately, the want of specific names is compensated by a common artifice of language. The most familiar instance of unpleasantness arising from defective sensation is met with among our tastes; and, as in numberless other cases, the typical representative of a class is used to provide a name for all the rest. Salt that has lost its savour, viands in which the customary seasoning is missed, the extreme dilution of any flavour,—these have long been taken as types of everything that fails to impart an adequate zest to our enjoyments. Insipidity has, therefore, become a term of extensive application to feelings of an unsatisfying nature.*

These feelings are met with throughout the entire range of our emotional life; but probably they are to be found in their most striking form in connection with the general exercise of our powers. The happiness of life as a whole must depend on our having sufficient occupation to afford an agreeable stimulation of feeling. It is true

* Various other terms, though not more specific than *insipid*, are also employed to denote the same idea of the unsatisfactoriness of deficient stimulation of the feelings, such as, *dull, slow, flat, stale, vapid, spiritless, lifeless, dead, dead-alive*. The emotional state must therefore be familiar enough in ordinary life.

that the necessities of life compel most men to work beyond the limit of health and pleasure : the minute subdivision of labour in modern times, moreover, aggravates this evil by withholding the relief of variety in occupation, demanding, as it generally does, the special exercise of one power or one set of powers to excess. It is, therefore, the irksomeness of excessive toil that is most frequently forced on our attention, as indeed it is the pains of excess that are in general the more obtrusive. Still, the irksomeness, arising from an unsatisfactory amount of activity, is not the less a fact.

“ Absence of occupation is not rest,
A mind quite vacant is a mind distressed.”*

This is the unpleasantness that we name *tedium, ennui*. The Germans name it well *Langeweile* ; for in this state all time seems a *long while*, it passes so slowly. Accordingly, it is to escape from this condition that men invent the various devices appropriately called *pastimes* ; and when time, by its dreariness, appears like a foe to be got rid of, men are not unwilling to “ kill time ” by engaging even in laborious sports or feverish excitements like gambling.

Perhaps in the light of these facts we may find an explanation of the sad phenomena of satiety. Variation of stimulus is essential to consciousness ; but even a change perpetually rung on the old set of objects begins after a while to be followed by more languid feelings. Novelty is, therefore, essential to enjoyment, as well as variety, both being necessary to stimulate feeling to the lowest

* Cowper's *Retirement*.

limit of pleasure. But most lives are restricted within a comparatively narrow sphere ; and, whatever variety they may enjoy, cannot long continue to find scope for novelty of impression. Accordingly, if the mind has opportunities of reflection, there is apt to arise, in varying degrees of intensity, a feeling of dissatisfaction with circumstances as unable to afford adequate stimulation in consequence of having lost their freshness. This feeling may attach itself merely to single objects which, from long familiarity, have lost their power to please. But it may also extend to the whole surroundings ; and if no beneficent necessity prevents the sensibility from morbidly preying on itself, the result may be a state of intolerable discontent with the general insipidity of life.

"How weary, stale, flat, and unprofitable
Seem to me all the uses of this world !" *

In this state of feeling may we not see the source of those pessimistic systems of thought, which find in human life nothing worth living for ? This incapability of

* *Hamlet*, Act 1, Sc. 2. The citation of *Hamlet* suggests that the student will find an invaluable subject of psychological speculation in the mood of mind which has been immortalised in this drama. The same life-weariness, with its developments in human character, has formed a favourite theme with the poets of the modern world ; and the student may derive an interest from comparing in this connection other celebrated treatments of the same theme, such as Byron's *Margaret* and Tennyson's *Maud*, but especially Goethe's *Faust*, and perhaps also the less successful reproductions of the Faust-legend by Marlowe, Müller, Lenau, and Bailey. There are some admirable remarks on this mood of the soul, with a general reference to its manifestations in life and literature, but with special reference to his *Sorrows of Werther*, in Goethe's *Wahrheit und Dichtung*, Book xiii.

receiving pleasure from the feeble excitement of objects that are no longer new may explain also the fact, often referred to by the poets, that to young eyes there is thrown over nature a glamour which vanishes with advancing years.

“ There was a time when meadow, grove, and stream,
The earth, and every common sight,
To me did seem
Apparelled in celestial light,
The glory and the freshness of a dream.
It is not now as it hath been of yore ;
Turn wheresoe’er I may,
By night or day,
The things which I have seen I now can see no more.”*

It only remains to add that another influence must be taken into consideration in order to comprehend adequately the phenomena of our pleasures and pains. Our feelings depend for their pleasantness or painfulness, not solely upon themselves, but also upon the relation in which they stand to one another. There are two results which follow from this.

1. A feeling, which, if allowed free play, might burst into vigorous activity or even absorb our consciousness for the time, may be held in check or, perhaps, wholly submerged by another feeling of an opposite nature, with which it happens to be associated. This is strikingly illustrated by the fact that the same object may, by its different aspects, awaken extremely different feelings. Take, for example, an exhibition of vice like drunkenness. By his droll behaviour the drunkard is adapted to excite irrepressible mirth as naturally as, by his deg-

* Wordsworth's *Ode on the Intimations of Immortality from the Recollections of Childhood*.

radation of humanity, a feeling of pitiful sorrow or of pitiless scorn. Take, again, æsthetic feeling or taste. Its vagaries have long been a subject of common remark. Nor is this hard to explain, for such feeling is often modified or entirely neutralised by other feelings that are out of harmony with it, such as physical pain, mental suffering, anger, or envy. Nearly all the objects that excite feeling are capable of being viewed in a variety of aspects; and consequently our emotional life is, in most instances, of a complex nature, while in many instances it exhibits a strange union of discordant passions. In such combinations it depends on numerous causes, which of the contending emotions is to prevail; but it will be found, in subsequent analyses, that the prevailing emotion is often misinterpreted from failure to appreciate the influence of the others with which it may have been associated.

2. Another important fact results from the relation of different feelings. A feeling may owe its pleasantness or painfulness, either wholly or partially to its contrast with the immediately preceding state of mind. Thus a mental state, which is neutral in regard to pleasure and pain, may be rendered pleasant by being a relief from previous suffering, while it may be rendered painful by the mere want of some previous luxury. By the same cause also, our pleasures and pains may be intensified; and it is this fact, that gives to sudden calamities an additional bitterness, as well as an additional zest to unexpected good news. In the vicissitudes of life this characteristic of our pleasures and pains finds fresh illustration every day; and therefore the pleasures of vicissitude have afforded to Gray a natural theme for one of his finest odes.

"See the wretch, that long has tost
On the thorny bed of pain,
At length repair his vigour lost
And breathe and walk again :
The meanest floweret of the vale,
The simplest note that swells the gale,
The common sun, the air, the skies,
To him are opening paradise."

These facts have been embodied in technical language by the psychologists. In so far as our feelings owe their agreeable and disagreeable characters to themselves, they are said to be *positive* or *absolute* pleasures and pains. On the other hand, the terms *negative* and *relative* are used, when pleasure and pain are due to comparison with some previous feeling.

§ 2.—*The Expression of Feelings.*

Our pleasures and pains have come to be associated with certain bodily actions, so that these can be interpreted by other persons as signs of our sensitive condition at the time. For accuracy three classes of such signs may be distinguished. (1.) There is the ordinary form of intelligent expression for feeling as well as thought in articulate language. This, however, is a mode, not of emotional expression in particular, but of mental expression in general, and, consequently, it presents no claim for special discussion here. (2.) There are many actions which are at first voluntarily adopted for the expression of various feelings, and afterwards become so habitual as to be practically automatic. Such are the established usages of courtesy, by which we express kindliness, respect, and other social feelings. Under this head ought to be included

also the numerous exclamations which different persons adopt as expressions of joy, surprise, horror, and other emotions. All expressions of this class are particular in their character. They are limited to particular individuals or to particular communities; and their various forms are often determined by trivial accidents, so that they seldom illustrate, except in a very remote way, any universal law of human nature. (3.) But, after making every allowance for these two modes of expressing emotion, there remain other expressive actions which are in all men apt to be stimulated by certain emotions, and which seem therefore to be connected with these by some general law. Such are the paleness of fear and the blush of shame, the arching of the eyebrows and opening of the mouth under the influence of surprise, the frowning of the brow into a frown of anger, the curling of the lip into a sneer of scorn, and the effusion of tears in sorrow. Even the internal organs of the body are affected by various emotions. This is indicated in the use of the word *heart*, as well as of its equivalents in other languages, as a general name for the sensibility. The terms *melancholy* and *splenetic* connect the feelings they express with the liver and the spleen respectively; while the Greek word *σπλάγχνα* points to some influence of compassion on the bowels.

These phenomena must have excited speculation at an early period. The surviving works of the ancient sculptors show that these artists had made the natural expressions of the emotions a subject of careful study. It is impossible also that mimicry and the histrionic art could have attained the perfection which they had reached in ancient Greece and Rome, unless play-actors had made at least an empirical acquaintance with the actions in which feelings are commonly expressed. The

so-called science of physiognomy may be said to have aimed at explaining the physical expressions of feeling, though it went generally on the wrong scent by tracing peculiarities of temperament to permanent features of anatomical structure, or by interpreting them in the light of fanciful resemblances between human features and those of other animals which were supposed to be endowed with certain natural dispositions.

A new epoch in the history of the study may be dated from the publication of Sir Charles Bell's *Anatomy and Philosophy of Expression as connected with the Fine Arts*, which appeared first in 1806 as a set of somewhat fragmentary essays, afterwards in 1844 in a greatly enlarged form. Another epoch is marked by Mr. Darwin's *Expression of the Emotions in Man and Animals* (1872). This work, while tracing all emotional expressions to three laws, lays great stress on the influence of heredity in the formation of these expressions; and it may, therefore, be taken as a monograph in exposition of the general evolution-theory, which is commonly associated with the name of the author. More recently Professor Wundt, while maintaining the general theory of evolution, has devoted some hostile criticism to Darwin's special theory of emotional expressions, and endeavours to explain them by three laws different from those of Darwin.*

*See Wundt's *Physiologische Psychologie*, Vol. ii., pp. 418-428; and compare his article in the *Deutsche Rundschau* for April, 1877. Both Darwin and Wundt give a sketch of the literature of the subject. A more recent work by Dr. Warner, *Physical Expressions: its Modes and Principles* (1885), refers to movements that express phases of organic life rather than of mind, and deals therefore with questions preliminary to those of emotional expression.

It is evident, then, that we are still a good way from being able to formulate a law of the relation between feelings and their bodily manifestations. The subject is one where the inquiries of psychology and physiology become inextricably intertwined, and on a field where both psychologist and physiologist must walk with hesitating steps. The inquiry is, indeed, strictly speaking, physiological rather than psychological ; it concerns the functions of certain bodily organs in so far as these are affected by mental states. In the present condition of science, therefore, it seems preferable in a handbook to be content with an occasional notice of such facts as may seem to be of psychological interest in connection with the manifestation of the various emotions. Meanwhile it may be observed that the tendency of emotions to associate with bodily symptoms is not equally strong in the case of all ; and in relation to this difference there is a generalisation of Hegel's, which seems sufficiently suggestive to deserve mention. He observes that our emotions may be separated into two classes as particular and universal, the former referring to the special condition of the individual, like anger, shame, etc., while the latter includes those emotions which, like the æsthetic, moral, and religious, are free from any tinge of individual interests. The former preserve a close association with their bodily expressions, whereas the latter tend to liberate themselves from these accompaniments. Moreover, owing to the complexity of our emotional life, the universal and the particular feelings often take on some of the characteristics of each other ; and the more any feeling tends towards particularisation, it tends also to embodiment in some form.*

* Hegel's *Encyclopædie*, § 401.

§ 3.—*Classification of the Feelings.*

By their very nature as states of merely subjective excitement, the feelings cannot be made objects of such distinct conception as the cognitions. A distinct and exhaustive classification of them is, therefore, beyond the reach of psychology in its present stage. In their lowest form, indeed, as aspects of our sensations, they follow of course the classification of these; and in their higher forms it might at first sight appear as if they could be classified on the same principle as the sensations, that is, by reference to the bodily organs with which they are associated. It is true, they are not, like the sensations, excited by affections of the bodily organs; but we have seen in the previous section, that they are apt to excite such affections as their natural expression. This principle, however, is found to carry us only a little way; for it is often impossible to connect a peculiar affection of an organ with one emotion exclusively. A convincing illustration of this is afforded by one of the most familiar manifestations of feeling, namely, the action of grief on the lachrymal glands. For the same action is set up by the very different emotion of anger, and even by the opposite emotion of joy, so that tears of rage and tears of joy are almost as familiar in daily life as tears of sorrow. Indeed, almost any emotion at a high pitch of intensity seems capable of stimulating the secretion of tears; while it is a still more remarkable fact, that the deepest griefs are tearless.

“ Home they brought her warrior dead,
She nor swooned nor uttered cry;
All her maidens watching said,
She must weep or she will die.”

No other principle of classifying the emotions has been suggested which is most obviously natural; and consequently no classification has been proposed which has met with general acceptance.* Any classification suggested at present must, therefore, be merely provisional; and the following is adopted mainly as a convenient order for describing the development of the emotions in our mental life. It starts from the rudimentary stage of feeling as simply the pleasurable or painful accompaniment of sensation. It then proceeds on the assumption that the more complex phenomena of our emotional life, like those of our intellectual life, are developed by the two universal processes of mental action, association and comparison. As the former is the more primitive process, it seems natural to notice first those emotions which are due mainly to association, and then to take up those in which the higher process of comparison is the most prominent factor. There are other emotions which presuppose a certain development of intellectual and moral life, as they arise in connection with our cognitions and volitions. These two classes of emotions, which may appropriately be styled intellectual and moral, will naturally come last in our treatment.

* In Professor Bain's *The Emotions and the Will*, Appendix B, the student will find a brief outline of some of the modern classifications.

CHAPTER I.

FEELINGS OF SENSE.

HERE feelings are considered as merely certain aspects of the elementary mental states, out of which the emotional life proper is developed. A superficial observation shows that, as sources of pleasure and pain, the rank of sensations is the reverse of that which they take as sources of knowledge. The more prominent in consciousness the pleasantness or painfulness of a sensation, the less is it adapted for that calm contemplation of its intrinsic qualities by which our knowledge is built up. Consequently, the general sensations, in contrast with the special, are, as a rule, with the exception of the muscular, associated in consciousness almost exclusively with the pleasure or pain they afford, and but slightly, if at all, with any information they communicate. The sensations arising from the healthy or unhealthy action of the nerves, of the digestive and other organs, commonly intrude themselves into consciousness only as states of pleasure or pain. Occasionally, indeed, a mind of scientific habits or of practical prudence may, by observation and reasoning, arrive at a knowledge of important facts associated with such sensations ; but for the ordinary mind they remain

states of a vague uninterpreted delight or uneasiness. The result is, that feeling in such cases remains indissolubly attached to the sensation in which it originates. Feelings of this primitive character may be of incalculable importance as contributing to the comfort and discomfort of our daily existence, which are of course essentially dependent on our animal condition. But as the sensations, arising from the functions of animal life, are incapable of being distinctly observed and compared, they do not enter readily into association with other sensations to form those more complex states of feeling which compose our emotional life.

Still it is not to be supposed that our emotional states are altogether dissociated from these vague general sensations. Occasionally we find the pleasantness or unpleasantness, characteristic of these sensations, applied to the description of feelings which have no apparent connection with sense. The heart is "broken" or "gnawed" with care, the feelings are "wounded," the spirit is "crushed." Often we are "cut" to the heart, we "burn" with impatience and other passions, we are "chilled" by a friend's unexpected manners. A certain "atmosphere of thought" is spoken of as "stifling," while we "breathe a freer air" when we adopt a different set of convictions. Even the pleasures and pains, which are apt to be thought of as the most grossly animal of all,—the sensations of the alimentary canal,—may be transfigured in this way, as is shown in the secondary application of such terms as relish, zest, gusto, on the one hand, as nauseating and disgusting on the other. These feelings have, in fact, been exalted into a sort of sacredness in the memorable blessing of those who "hunger and thirst after righteousness."

It is not always easy to tell how this transference of

the names of sensations is brought about. In some cases it seems to arise from a resemblance of some sort between the sensation and the feelings designated by its name. In other cases, however, its source is to be found in facts connected with the expression of the emotions. It was shown, in the immediately preceding Introduction, that emotions are associated in some way with various bodily organs, so that the affection or movement of these forms a more or less distinct expression of the associated emotions. This association, however originated, seems to react on the emotions; and thus an organic affection or movement comes to be suggestive of the emotion which it primarily expressed. For this reason, if for no other, dyspepsia, which may be induced by various unpleasant passions, especially by those of a malevolent nature, tends to darken the mental life by passions of the same order; while, on the other hand, eupepsia, which is promoted by a cheerful and benevolent disposition, returns this favourable influence by making the culture of such a disposition more natural. A careful observer may easily convince himself by experiment, that those movements of the facial muscles, which are among the most familiar manifestations of feelings,—smiles, frowns, sneers,—can be made to excite in a vacant mind the emotions which they commonly express; and it is a significant confirmation of this, that, in hypnotic states in which the consciousness is dominated by purely natural associations, it is common for an operator to introduce into his subject's mind any feelings or ideas he wishes by setting the features or limbs to some adjustment usually expressive of an emotion.

There is another fact deserving of notice in this connection. Pleasure and pain, by whatever cause excited,

tend to combine with their natural emotional associates ; and consequently any agreeable sensation is favourable to joy, love, hope, and æsthetic delight, whereas any disagreeable sensation is apt to excite melancholy, ill-temper, fear, despair.

But in all such cases it still remains a distinctive characteristic of the general sensations as a class, that they are not so adapted for entering into the vast combinations of feeling which form the most interesting as well as the most important feature of our emotional life. Such combinations have their chief source in the definitely comparable sensations of special sense, and especially of hearing and sight. In signalling these two senses it is meant that they are better adapted than any of the others for developing the more complicated emotions as well as the more complicated cognitions ; and this superior adaptation may be made evident by a comparison of the different senses in respect of their emotional power.

I. Of the two less intellectual senses, taste and smell, almost enough has been of necessity said in analysing the cognitions which they go to form. The sensations of taste, though more distinctly marked than those of smell in our ordinary consciousness, were shown to be but slightly endowed with associability or comparability, and therefore to be incapable of distinct representation. Accordingly, it was observed that they do not readily enter into those ideal combinations, which are equally essential to emotional and intellectual development. Moreover, the sensations of taste are too closely bound up with the functions necessary for the preservation of life to admit of free indulgence in their pleasantness ; and this also, as we shall find, excludes them from æsthetic uses. Burke, indeed, thinks that the pains,—

we might say, the horrors,—of taste may enter into our feelings of the sublime ; but the only instance he gives is the literary use of the phrases, "a cup of bitterness," "to drain the bitter cup of fortune," "the bitter apples of Sodom."* With these may be compared such terms as "sweet" or "sour temper," "sour looks," "bitter fate," "honeyed words," "bitter language." Expressions of this sort are merely examples of what was noticed a few pages before,—the transference of the names of sensations to describe feelings which have no connection with sense ; and it may be questioned whether the use of these expressions ever approaches the character of sublimity.

II. The sense of smell, as already observed¹, is in man mainly emotional. It is true that, in many species of the lower animals, its organ is more developed and its uses are more numerous. It serves to attract the sexes, as well as parents and young, to one another ; it forms a guide in the discovery of food, in evading more powerful enemies, and in tracking prey. Whether these facts are causally connected with the emotional character of odours in man, is still a matter of conjecture. It is no mere conjecture, however, that in each individual these sensations afford many of the familiar pleasures of life. Not only the interested enjoyments of the table, but all the purer delights of forest and garden, of rural life in general, derive a large element from the pleasures of smell. This naturally leads us away from the simple sensations of odour to the emotional associations which they form ; but although the subject belongs properly to the next chapter, it is not altogether out of place to

* *Inquiry into the Origin of our Ideas of the Sublime and Beautiful*, Part ii., § 21.

notice the comparative readiness with which odours enter into such associations. It has long been observed, for example, that odours have an influence on the sexual feelings; and the use of incense in religious service points to some connexion with the feelings of devotion. It is true, that these emotional influences of smell are more prominent among Southern people; and it may be inferred that the increased and uninterrupted development of odours under a warmer sun and a perpetual summer, is paralleled by an increased development of sensibility to their effects.*

III. Touch is commonly conceived as more destitute of emotional character than any of the special senses. It is, therefore, a remarkable fact, that the term *feeling*, which is the most general name for the phenomena of pleasures and pains, has been borrowed from the sense of touch. As already hinted in treating of our tactile perceptions, the emotional side of this sense is probably overlooked from the fact that its contributions to our mental life have become largely absorbed in those of sight. Yet a more careful examination soon shows that the emotional elements of touch are neither few nor unimportant; and that they obtrude themselves in our daily consciousness is shown by the fact, that a strong emotional impression is very commonly described by saying that we feel *touched*, while a strong emotional stimulant is spoken of as *touching*. The effect of touches upon our feelings varies according to the part of the skin affected, as well as the quality of the sensation excited.

1. The emotional susceptibility of different parts of

* Some interesting observations on this point will be found in a popular, but suggestive, little book by Dr. George Wilson, *The Five Gateways of Knowledge*, pp. 62-85

the skin evidently does not show a close parallel to their intellectual discriminativeness. The reason of this I take to be, not that the parts of great discriminative power are not also extremely sensitive to the pleasantness and unpleasantness of touches, but that the two modes of mental activity, cognition and emotion, are essentially incompatible. Accordingly where, as in the hand, consciousness is usually engrossed with the information given, the emotional uses of the organ are reduced to a minimum. Still the hand affords many tender delights, as well as many repulsive unpleasantnesses, of touch. It is the grasp of the hand that is taken, over most of the civilised world, as the appropriate expression of common kindly feelings. The tongue, though seldom used by man for discriminating anything but articles of food, and though the most acute part of the whole organism, is yet scarcely ever applied to emotional uses. But dogs, cows, and other animals, lick the objects of their affection. It is in parts not commonly employed for purposes of discrimination, that the highest emotional susceptibility is realised. The lip and cheek,* and even parts of lower intellectual rank, are commonly associated with the most delicious enjoyments of touch.

2. Among the various kinds of tactual sensation, that which yields the purest and most independent pleasure is smoothness. Softness is also a plentiful source of agreeable sensations; but it is more dependent on concomitant feelings, and accordingly it is more apt to be supplanted by such associations as a rough or clammy surface. On the other hand, even the hardest substances, when highly polished, are capable of yielding an independent delight in their smoothness. Even the pleasure

* Some African tribes rub noses in expression of friendly feeling.

that we take in the sight of polished surfaces is, in a large measure, a revival by suggestion of the tactile feeling which such surfaces excite. The additional gratification, also, which we derive from gloss or lustre, though partly visual, is likewise partly due to its manifest suggestion of smoothness.*

But the greatest volume of enjoyment, that we owe to touch, is found in the combination of its two most emotional sensations, smoothness and softness. The delicate petals of our common flowers, the downy feathers of birds, the sleek and glossy fur of many animals, are objects over which the fingers play with perpetual delight; while the use of feathers and furs for clothing, as well as the imitation of their qualities in cloths of velvety texture, is evidently suggested by the agreeableness in the touch of smooth and soft bodies. But it is the human skin, especially in the infant and the female sex, that realises most completely the conditions of delight in tactual sensation; and the *tenderness* of such delight has furnished to thought and language a description characteristic of all kindly emotions.

Among the pains of this sense hardness and roughness are of course the most prominent; and their combination, as in unwrought stone or unpolished iron, is as repulsive as the union of their opposites is attractive. The terms *hard* and *rough* are, therefore, of very extensive application to objects that excite emotions of a disagreeable nature. But it is important also to observe that smoothness and softness, especially the latter, are

* The reader of Burke's *Inquiry into the Origin of our Ideas of the Sublime and Beautiful*, may recall the extravagant importance which he attaches to smoothness among the conditions of beauty. See especially iii., § 14, and iv., § 20-25.

themselves capable of an unpleasant excess. Perhaps the unpleasantness in such cases is due to defective stimulation ; and that may be the reason why the terms *smooth* and *soft* are often figuratively applied to objects of a mean and contemptible character. But whatever may be the cause of this unpleasantness, the pain of hard and rough impressions is undoubtedly due to excessive stimulation. Hardness evidently is akin to those violent pressures which crush and bruise the tissues. On the other hand, roughness resembles various sensations of an intermittent character, which were referred to before when explaining the nature of discord. In such sensations it seems as if the intermission gave time for the organ to recuperate, and thus to become capable of a wasteful degree of activity, which would be impossible under the numbing influence of a continuous stimulation. In this way we may explain the unpleasant effect produced by a discordant clash of sonorous vibrations, or by a flickering light. Thus also it would appear that instead of the continuous impression made by a smooth body, a rough surface, being formed of projections separated by minute intervals, owes its unpleasantness to the violent tactual excitement caused by a series of intermittent shocks.

The sensation of weight is mainly muscular, but may be noticed here, as it is also to a slight extent tactual. The only definite enjoyment which such sensation yields is that arising from a weight light enough to be borne with moderate exertion, so that *light* comes to be descriptive of all performances that are made pleasant by being easy. On the other hand, the extreme easiness of any action is unsatisfying ; and consequently *light* is often applied to objects of contemptible triviality. But the decided form of uneasiness connected with this class

of sensations is that of excessive weight ; and therefore *heavy* is a term of wide use to describe the various feelings arising from the difficulties of life, by which its energies are oppressed.

It only remains to add that, as touch is endowed in an eminent degree with distinct representability, its pleasures and pains enter readily into those ideal combinations which form the more complex emotions. Thus, "the touch of a vanished hand," and "remembered kisses after death," are referred to in well-known poems of the Laureate's as revivable with distinctness and suggestive with power enough to stir the deepest movements of our emotional nature.

IV. Hearing is a sense of the very highest emotional value. Superior to touch in intellectual adaptation, it is superior also in capacity for pleasure and pain. In this capacity it is superior to sight as well, so that, although it does not ally itself so definitely with specific emotions, yet it originates some which stir our nature more profoundly. This is most familiarly illustrated in the influence of music. Here, it must be borne in mind, the influence of this art is considered, not in all its manifold character, but merely at its lowest—its sensuous stage. There is considerable difference of opinion as to the nature and origin of the emotional effects produced by music ; but all theories on the question must recognise a certain basis in organic sensibility, on which higher effects are built up. That sensibility implies, as has been explained in earlier pages, a capacity for agreeable and disagreeable impressions, both from single tones, and from the melodic and harmonic relations of different tones.

Single tones depend for their pleasant or unpleasant character on their intensity, their pitch, or their quality. Extremely loud or extremely shrill sounds are painful ;

and the pain seems obviously due to the violence of the organic action which they excite. Harsh qualities of tone have been already traced to the same cause as discords,—the inharmonious interference of the overtones with the fundamental tone.* Now, the unpleasantness of discord has just been explained as, like roughness, caused by a series of intermittent stimulations, which allow the organ to recover between each, and thus call forth a wasteful expenditure of energy.† On the other hand, the unsatisfactory character of the weak tones, which from the absence of overtones possess no decided quality, is perhaps due to defective stimulation.

The sensibility to auditory enjoyment, however, in its refined forms, is a later growth of evolution in the individual as well as in the race. Not to speak of the innumerable harsh cries of the lower animals, or the deafening noises which monkeys delight to make by beating sticks as well as by screeching, it is evident that, in early life, when the auditory sensibility is still undeveloped, and the general nervous organisation robust, the ear can not only endure, but enjoy, violent excitements,—loud noises that irritate, if they do not stun, an adult ear, or wild tones that pay little or no regard to musical law. The coarse sensibility of the savage enables him also to find delight in a music which is distinguished

* See Book ii., Part i., Chapter i., § 4 (B). ii.

† The depth of feeling which may be stirred by the mere organic effect of discord is strikingly displayed by the experience of hypnotic patients. "A discord, such as two semi-tones sounded at the same time, *however soft*, will cause a sensitive patient to shudder and recede when hypnotised, although ignorant of music, and not at all disagreeably affected by such discord when awake." (*Neurypnology, or the Rationale of Nervous Sleep*, by James Braid, p. 62, note).

mainly by its overpowering stimulation of the sense. It may be observed, moreover, that, as the limit of healthy excitement varies even in the individual for hearing as well as for other senses, men of general refinement, in hours of boisterous mirth, relapse not unnaturally into the early rude taste for uproarious song and clamour.

There is, however, a peculiar richness in the emotional effects of music, which extend over a vastly wider area than the mere sensibility to sound. It is in fact practically impossible to set a limit to the feelings which may be stirred by this art ; and no psychological theory could be accepted as a complete account of the nature and origin of the emotional influence of music, which restricted that influence to one set of emotions, such as sexual feeling, or derived it exclusively from one class of sounds, like those of speech. The truth seems to be, that tones readily associate with all the leading emotions of the human soul, and that therefore the sensuous gratifications of tone become at once intermingled with some of the associated emotions, though which of these shall be stirred must be determined by the various circumstances of the individual and of the moment. It is a significant fact that, in Collins' fine *Ode to Music*, the passions, though of the most conflicting order, are all pictured as resorting to this art, at once for their appropriate stimulus and for their appropriate expression.

V. The sensations of light and colour owe their pre-eminent intellectual value to their comparative neutrality in respect of pleasure and pain. The organic feeling is here so slight, that, in mature life, at least among educated minds, it is generally absorbed in the predominant perceptions, with their intellectual and emotional accompaniments. Still the emotional side of visual sensation is not wholly obscured ; and among

children, as well as the untutored and uncivilised, who exercise less control over their feelings, the sensuous excitement of light and colour is frequently to be observed.

1. The sensibility to visual pleasure commences with the earliest form of visual sensation. There can be no doubt of the fact, that for months before the child shows any appreciation of colours, he finds pleasure in pure light;* and this remains throughout life the simplest enjoyment of vision. This enjoyment, however, is of two kinds.

(a) When pure light is spread over a large expanse, as in a luminous atmosphere with the sun away from the eyes, or even when it is softened, as by a lampshade, the sensation excited belongs to the gentle and soothing class, and consequently light has always been regarded as itself one of the purest of organic gratifications, and as affording a type of the purest gratifications of life in general. "Truly," says an old Hebrew, "the light is sweet, and a pleasant thing it is for the eyes to behold the sun."† The note is one that is echoed by many a tone of ancient literature. So the light of life is often used as a symbol of all that makes life worth living; while terms, like *bright* and *serene*, expressive of clear light, are found appropriately descriptive of general happiness, whereas terms, that express the absence of light, such as *shadow* or *gloom*, are extended naturally to any joyless condition of mind.

(b) But light, when concentrated in brilliant centres,

* Preyer, *Die Seele des Kindes*, pp. 6-17.

† Eccles. xi., 7. The commentators cite in illustration Euripides, *Iphig. in Aulis*, vs. 1218:—ἡδὺ γὰρ τὸ φῶς βλέπεω.

is a powerful stimulant. The sensation produced is then of an exciting character; and its enjoyment indicates, therefore, a coarser sensibility. The pleasure that we find in bonfires and pyrotechnic displays does not imply any refinement of sense.

2. It is also a coarser sensibility that draws its pleasures from the colours at the red end of the spectrum. Experiments show that these are the earliest to be recognised by the child;* and they remain throughout life the most exciting forms of colour-sensation. The ecstasy of children and savages at the sight of brilliant reds is an evidence of the strong effect which these produce. A curious illustration of this effect is sometimes found in states of mental disease, when the consciousness falls away from rational control into the sway of mere natural sensation. Thus, the dancers of St. John and St. Vitus in Germany were infuriated, while the Tarantati of Italy were thrown into an ecstasy of delight, by red colours.† This effect is further illustrated by the experience of some of the patients cured of congenital blindness, while their visual sensations still retained the impressiveness of novelty. Cheselden's patient is said to have thought scarlet the most beautiful of all colours, and of others those pleased him most which were "gay,"—an expression I take to mean those in which red is the predominant tint. On the other hand, black gave him uneasiness, and a negro at first excited feelings of horror. It is perhaps indicative of some individual, or at least feminine, characteristic, that Wardrope's patient

* Preyer, pp. 6-17.

† Hecker's *Epidemics of the Middle Ages*, Part ii., pp. 17, 19, note, 29, 41.

thought the blue sky the prettiest thing she had ever seen; but, when tried with other colours, she liked yellow best, then pink. Apparently dark objects looked ugly to her as they did to Cheselden's patient.* The more violent emotions, therefore, seem naturally to associate with red colours, while the colours at the other end of the spectrum have an affinity rather with the milder emotions.†

3. While light, pure or coloured, is the peculiar sensation of sight, the eye seems adapted to receive pleasurable impressions from other visual phenomena as well. Form, indeed, might be thought to require an intellectual appreciation for its enjoyment; but as harmony of tones and probably also harmony of colours, answer to some adaptation in the organs of hearing and sight, form also seems to be the source of a purely organic pleasure, even though the gratification it affords be partly derived from the intellectual activity which it calls forth. In consequence of the various factors of visual gratification being thus usually intermingled, it is difficult to obtain direct evidence of the above statement; but it seems to be certified by the fact, that Cheselden's

* *Philosophical Transactions*, 1826, pp. 534-5.

† What makes the reds more exciting than other colours, is not certain; but it has been conjectured that the less frequent occurrence of the former in nature allows the sensibility of the eye for them longer periods of repose, and consequently a higher degree of stimulation without being exhausted. This, however, is by no means obviously the most natural explanation. In any theory it is perhaps worth while to keep in view the fact, that, though red rays themselves are not favourable to vegetation, yet the processes of plant-life are stimulated by orange and yellow more powerfully than by any other colours, while these processes are almost arrested by the rays towards the violet end of the spectrum.

patient received a peculiar pleasure from smooth and regular bodies at a time when he had not yet learnt to distinguish shapes by sight, and could not tell what it was in bodies that made them pleasing.* The pleasure which the eye takes in well-shaped bodies may, indeed, not be, in the most restricted sense, a visual sensation ; it may be due rather to the easy muscular sweep of the eye while surveying such objects in contrast with the broken, and therefore more violent, effort of grasping an angular or irregular form. For the muscles, being mostly levers resting on a fulcrum at one end, describe most easily a curved line with the other, so that any line with abrupt angles is the result of an uneasy strain until it becomes easy by discipline. But the pleasure we take in the form of visible bodies, even if it belongs to the muscular sensations, is noticed here for convenience, as it affords an opportunity of pointing out how insensibly the organic pleasures of sight pass over into that larger store of mingled sensuous and intellectual enjoyments, of which the visible world is the source. The very simplest perceptions of sight cannot but open up this world of joy to some extent. It is true, that to most minds the visible world has become so stale, that its perennial delightfulness is seldom felt ; but there are few who are not incited at times to a fresh relish of its pleasures, while there are many who continue to find in them the purest enjoyment of life. Most men have probably overcome the numbing effect of the world's staleness at times, as when, after the organism

* The exact words of the report are :—"He thought no object so agreeable as those which are smooth and regular, though he could form no judgment of their shape, nor guess what it was in any object that was pleasing."

has had its sensibility quickened by a night's repose, they have opened their eyes to the splendours of the dawn; and the memory of such an experience may enable us to realise the keenness of the delight with which the visible world discloses itself to the view for the first time. It is said of Cheselden's patient, that, "before he was couched, he expected little advantage from seeing worth undergoing an operation for, except reading and writing; for he said, he thought he could have no more pleasure in walking abroad than he had in the garden, which he could do very safely and readily." But after his sight was restored, "he said, every new object was a new delight, and the pleasure was so great, that he wanted ways to express it; but his gratitude to his operator he could not conceal, never seeing him for some time without tears of joy in his eyes and other marks of affection: and if he did not happen to come at any time when he was expected, he would be so grieved that he could not forbear crying at his disappointment. A year after first seeing, being carried to Epsom Downs, and observing a large prospect, he was exceedingly delighted with it, and called it a new kind of seeing."

VI. As being of peculiar importance among the general sensations, those of the muscular sense deserve special mention here. It has been already observed that the feelings of tension and of slow movement are most valuable for purposes of cognition, while those of rapid movement are most obtrusively sources of pleasure and pain. The sensations of mere tension—of a dead strain—are probably least emotional. There are, indeed, certain pleasures and pains connected with the support of the body in an erect posture, with the steady resistance to any force, with being baffled by an insuperable

obstacle ; but these emotional effects are largely due to associated ideas rather than to the mere sensations involved.

The emotional character of the muscular sense is more decidedly seen in the sensations connected with movement. Even slow movements are not without some pleasures and pains. Their sensations are of the mild and soothing type ; and accordingly they are often of service when a soothing effect is desired. This effect is heightened by the fact that slow movements, at least in early life, when our most common ideas are formed, scarcely ever arise from a vigorous condition of the muscles, but rather from their exhaustion or decay. Slow movements are therefore felt to be in harmony with conditions of weariness and sadness. They are adopted in the rock of the cradle and in the lullaby to soothe a child fretful with sleepiness. We prefer a staid gait and sedate manners, quiet talk and slow music, when tired with a hard day's work, or when saddened by any mournful event ; and in general the aged exhibit this preference at all times. Mainly to the same cause also must we ascribe the pace of funerals, the elocution of religious services, the *time* of plaintive and solemn music. On the other hand, to the young, and to all in the fresh vigour of health, slow movements are apt to supply but an imperfect outlay of energy ; and in the slang which *fast* society has originated, as already remarked, *slow* is a common and not inexpressive term for anything insipid.

The sensations of rapid movement are of the exciting type, and in excessive forms approach the nature of intoxication. The mercurial movements of the young, the exuberant muscular display of the healthy, are evident sources of keen animal enjoyment. Skating,

with the unusual speed and grace and novelty of its motions, affords one of the most delicious and healthy forms of this pleasure. The dance also derives a large share of its attraction from the same source, though, from the accessory circumstances in which it is frequently enjoyed, it is more apt to work an unhealthy excitement, and thus to acquire the tyrannous fascination of coarser stimulants. This is proved not so much by the excess with which this muscular excitement is sought in the common dissipations of society, but still more strikingly in the frenzied extravagance of barbaric religious festivals, in which the dance forms a prominent ceremony. The worship of Demeter and Dionysus in the ancient world, the dancing manias of the middle ages, and the boisterous exhibitions of religious ecstasy in some modern communities, are instances of the intoxicating excitement that may be stimulated by the rapid rhythmical movements of a dance.

Such is feeling at its rudimentary stage of mere sensation. By the process of abstraction a sensation may attract attention to one of its aspects exclusive of the others; and thus its pleasantness or unpleasantness may become predominant without regard to any of its other qualities. Usually the pleasure or pain, of which at any moment we are conscious, arises from a variety of sources; and therefore, even if partly or wholly due to sense, it loses the definiteness belonging to any single pleasant or unpleasant sensation. There thus results sometimes a feeling of vague agreeableness or disagreeableness,—that emotional state which we express by such terms as joy, gladness, delight, mirth, cheerfulness, on the one hand, by grief, sadness, sorrow, on the other.

But, to understand our emotional life in all its rich-

ness, we must investigate the specific forms which this general agreeableness and disagreeableness assume under the play of modifying influences. These influences, when external, can act only through the processes of mind; and the process, which comes into play first, is association.

CHAPTER II.

FEELINGS ORIGINATING IN ASSOCIATION.

ASSOCIATION gives a peculiar tinge to our feelings by connecting them in consciousness with their objects or causes. The conscious states, thus originated, are described by such terms as liking and dislike, love and hatred, as well as other synonymous expressions, some of which will be noticed immediately. The formation of such states is easily intelligible from the nature of the pleasures and pains, out of which they arise. These pleasures and pains have their origin in certain objects, with which they are thus necessarily co-existent. When we become conscious of this co-existence, an association is formed between the feeling and its object, so that the feeling will recall the object, or, as happens probably oftener, the object, even when merely remembered or imagined, may revive the feeling with which it was associated. But observe the effect which this has on our emotional relation to the object. If the feeling involved is pleasant, then, from the very nature of pleasure, there is an instinctive impulse to prolong it; if it is painful, there is a similar impulse to bring it to an end. But I cannot prolong a pleasure without keeping in consciousness the object which causes it; I cannot bring a pain

to an end without banishing its object from consciousness.* It is for this reason, that, in the former case, I am said to "dwell upon" the object, to "linger over" it, to "take pleasure in" it, such phrases being often used as synonymous with *liking* or *love*. On the other hand, dislike or hatred is often expressed by such terms as aversion and revulsion; its object is described as repulsive,—as one that we cannot "brook,"† that we can "take no pleasure in," that we are "displeased with,"—as one that we cannot "bear,"‡ that we cannot "bear the sight of," that we "cannot away with."

The object of a feeling must here be understood in its widest sense. Frequently of course,—perhaps most frequently,—it is the natural cause of a feeling, that is, the phenomenon which, by its natural properties, is adapted to produce the feeling. Thus a sensible body produces with a healthy constitution its appropriate sensation; the death of a friend naturally awakens sorrow; the good opinion of another gives us joy. In other cases, however, an object becomes associated with a feeling by a mere accident; and its subsequent power to excite the feeling depends, not on its intrinsic properties, but merely on its accidental association. Only by bearing this in mind can we explain the fact,

* "Amor nihil aliud est, quam lætitia concomitante idea causæ externæ; et odium nihil aliud, quam tristitia concomitante idea causæ externæ. Videmus deinde quod ille, qui amat, necessario conatur rem, quam amat, præsentem habere, et conservare; et contra, qui odit, rem, quam odio habet, amovere et destruere conatur. (Spinoza, *Ethica*, iii., 13, Scholium).

† Anglo-Saxon *brucan*, enjoy.

‡ Suffer, endure, tolerate, as well as the Old English and Scotch *thole*, are also employed.

that the most unreasonable hatreds are often formed for persons intrinsically loveable, while love clings at times with tragic pathos to those who have done everything by which love is commonly repelled. For the same reason any paltry article, like many a keepsake, that is intrinsically of trivial value in relation to pleasure or pain, may yet become linked with a power to awaken either an unspeakable gladness, or a sorrow

“ Whose muffled motions blindly drown
The bases of the life in tears.”

It is evident, therefore, this description includes a range of emotions second to none either in their variety or in their importance as factors of human life.

As our feelings of liking and dislike may have their sources in external nature or in ourselves or in other persons, they may be conveniently studied under these three heads.

§ 1.—*Feelings for External Nature.*

All the phenomena of the external world, organic and inorganic alike, are capable of exciting various modes and degrees of fondness and revulsion, according to the predominance of pleasure or pain in the impressions they produce on our consciousness. Occasionally also they awaken that mingled state of feeling, in which delight and aversion strangely alternate. Varieties in the form of these feelings may be determined by single definite objects, on the one hand, or, on the other, by more or less indefinite groups of objects.

(A) The definite object of a liking or dislike may be an animal, a plant, or any inanimate thing; and the feeling for it may be based either on the effect of its

intrinsic properties on our sensibility, or on some extrinsic association. We need not dwell again on the fact, that any object may, by the merest accident, become linked in our consciousness with agreeable or disagreeable feelings. It is well known, that many ennobling sentiments, as well as some of the most whimsical infatuations of human life, have their origin in this cause. But in the evolution of our feelings for nature we shall discover the same tendency which may be traced in the general evolution of mind,—the tendency to liberate our emotional life from subjection to the merely *natural* effects of association, to raise it into the free control of reason.

Consequently, the most interesting feelings of this class are probably those which are due to intrinsic properties in the object of love or aversion. The special interest, centring on such emotions, consists in the fact that they enter into the feelings of the beauty and ugliness, with which we invest natural objects. These feelings must be considered again; but at present it may be mentioned that some writers have ascribed them entirely to association. There is at least this inadequacy in such a theory, that it overlooks the intrinsic pleasantness of the sensations, especially of sight and hearing, which beautiful objects are adapted to produce. The primrose may to many be "a primrose and nothing more;" but it *is* a primrose,—an object endowed with the property of producing certain sensations in every human sensibility.

At the same time there is this of truth in the theory, that the agreeableness of a beautiful object is not to be found, solely or even mainly, in the pleasant sensations which it is intrinsically qualified to produce. The very fact, that to the uncultured mind the primrose is simply

a primrose and nothing more, implies that, while it produces the natural sensations of a primrose, it fails to open up the world of thought and sentiment, with which it can become associated by culture. Without, therefore, foreclosing further inquiry into the feelings of beauty, it is evident that these must draw largely from the associations which mental culture forms. This conclusion is confirmed by the most hurried reflection on the poetry which interprets for us the influence of natural objects over the soul. If the poet lingers with æsthetic delight over a "wee modest crimson-tipped flower," it is because

"To him the meanest flower that blows can give
Thoughts that do often lie too deep for tears."

(B) But this feeling for nature takes a larger range, when it attaches to no limited object, but embraces an indefinite group of phenomena. It is thus, that we may describe the sentiment excited by scenery. Evidently such a feeling presupposes a considerable development of mental culture. The child, during the first few months of life, is extremely restricted in his grasp of things. He notices an object near his eyes, or clasped in his hands; he catches any distinct or startling sound in the immediate neighbourhood: but even a limited group of objects, such as make up the general appearance of a room, is obviously beyond his apprehension. He requires a longer growth to seize intelligently the entire view of a garden or a field, or the nearest surroundings of home; and he may never attain the ability to master for intellectual or emotional results the vast outline and variegated colour and innumerable subordinate features of an extensive landscape.

It need scarcely be said that the pleasantness or unpleasantness of a scene is sometimes purely extrinsic. The dominating mood of the soul at the moment when a scene is viewed may overpower the most pronounced natural adaptation to give pleasure or pain. Innumerable illustrations of this are to be found in the love-songs of all literature. Drawing their imagery mainly from nature, these lyrics give an infinite variety of expression to the psychological fact, that the cheerful or gloomy aspect of the external world depends mainly on the mood of the ruling passion. Through all their changes runs the general strain,—

“ Except I be by Silvia in the night,
There is no music in the nightingale.”

It is thus that the most charming landscape may become to the sorrowful spirit invested in a gloom which it will wear throughout life, while it requires little inherent attractiveness about the scenery of a happy home to make it capable of awakening a deeper and more varied joy than any other part of the world. Even the disinterested enjoyment of beautiful scenery is closely dependent on the pleasantness of the circumstances in which a scene is visited ; and the great extension of this emotion in very recent times is probably due in a considerable measure to the facilities for comfortable travelling in modern railway-coaches and steamers and luxurious hotels.

But the development of the emotional life, as of the intellectual, is essentially an elevation above the tyranny of merely natural influences,—of temporal and spatial associations. Consequently the expansion of our love, as well as of our hatred, for natural scenes is continually raising us out of merely natural into rational feeling. It

is thus that the cultivated emotional nature refuses ever more and more to be subjugated by selfish or restricted associations which are meaningless for men in general; and, while not ignoring the natural power of such associations, seeks its enjoyment rather in those that are of universal interest to intelligent beings. As it grows, therefore, from the intellectual and emotional grasp of the little nook to that of the vast landscape opening from a mountaintop, so it may expand into what has been not inappropriately called "cosmic emotion,"—an emotion which, though not exhausting the religious sentiment, yet forms not its least noble factor in the higher order of minds. The poetry of the Hebrews shows at what an early period man had learnt to look with devout feeling on the sublimer phenomena of nature;* and the larger insight into the vastness of the universe, which is a chief result of modern science, has surely not weakened this feeling. "When I gazed into these stars, have they not looked down on me as if with pity, from their serene spaces, like eyes glistening with heavenly tears over the little lot of man! Thousands of human generations, all as noisy as our own, have been swallowed up of time, and there remains no wreck of them any more; and Arcturus and Orion and Sirius and the Pleiades are still shining in their courses, clear and young, as when the Shepherd first noted them in the plains of Shinar."†

In the same way the dislike, which is limited at first to single objects or scenes that are intrinsically or extrinsically painful, may expand into a pessimistic emotion in view of the universe; and to such a mood

* Compare especially Job ix., 6-9; Psalms viii., xix., 1-6, and civ.

† Carlyle's *Sartor Resartus*, Book ii., Chapter 8.



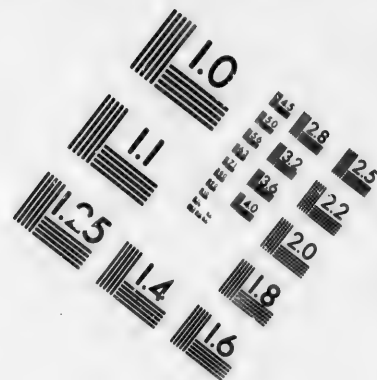
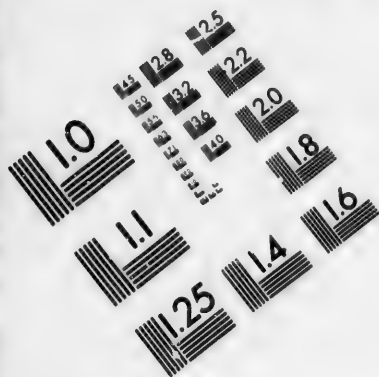
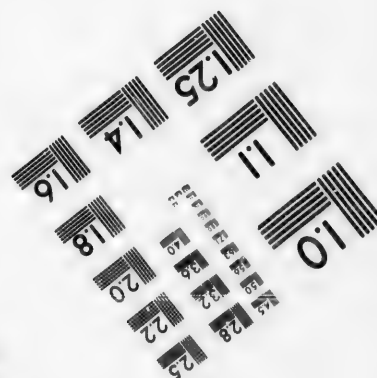
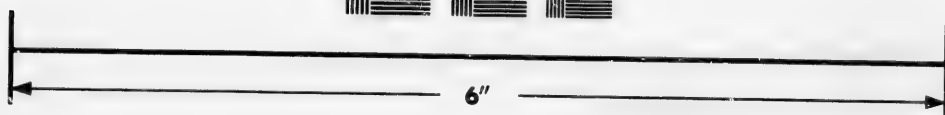
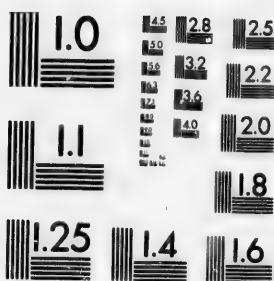
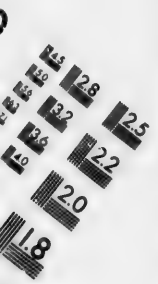


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic
Sciences
Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503



the stars, no longer "glistening with heavenly tears,"
may become

"Tyrants in their iron skies,
Innumerable, pitiless, passionless eyes,
Cold fires, but with power to burn and brand
His nothingness into man."*

§ 2.—*Feelings for Self.*

Like external nature and other human beings, we ourselves are adapted to excite agreeable and disagreeable feelings in our own consciousness; and this power must be ascribed to all the varied features of our nature, external and internal. Not only our permanent characters, but also our occasional thoughts and feelings and actions, our personal appearance, our dress, and even the estimate taken of us by others, are all capable of exciting varied states of emotion. Here again the evolution of feeling is in the direction already indicated, from the tyranny of restricted influences to delight in the sources of enjoyment that are universal.

The general form of these self-regarding emotions is, on the one hand, self-complacency in the contemplation of anything about ourselves that is calculated to give pleasure, on the other hand, a dissatisfaction with ourselves on account of anything that is fitted to produce pain. It is not of course necessary that the feature, causing pleasure or pain, should be really attached to us. It need only be before the consciousness, whether as a known fact or as an imagined fiction; and therefore not a few forms of self-gratulation, as well as of self-torture, are based on nothing more substantial than the power of fancy.

* Tennyson's *Maud*, xviii., 4.

Self-complacency, though often based on fanciful grounds, tends under culture to grow into that self-respect, that "honest pride," that feeling of "honour," which forms an important element of moral character. In like manner dissatisfaction with oneself tends ever more and more to be confined to the shock of pain which is felt on doing wrong, and to form therefore the distinctively moral sentiment known as *remorse*.

The feeling of shame evidently arises from such disagreeable impressions as originate other forms of self-dissatisfaction ; its peculiarity seems mainly due to the fact, that it implies a reference to the actual or possible knowledge by others of the circumstance which causes the disagreeable impression. This enables us to explain the confusion in thought and language between shame and a feeling so different as modesty. Any unusual exposure before others, such as even the introduction to strangers, is apt to produce, in sensitive natures, a shock like that which is due to the real or fancied inspection by others of something unworthy in us ; and the emotional shrinking from such exposure constitutes the essential character of modesty.*

The feeling of shame connects itself thus with the love of esteem. This emotion was regarded by many of the older psychologists as an instinctive form of human sensibility ; but it requires no very skilful analysis to find

* Mr. Darwin's theory of blushing chimes in with this account of the emotion which it expresses. He regards it as due to the unusual attention directed to the exposed part of the body causing an unusual discharge of blood in that direction, and he finds that it diffuses itself over a larger surface of the body among races that do not dress so completely as civilised men. (*Expression of the Emotions*, Chapter xiii.).

in association with the good opinion of others many pleasantnesses which make the desire of esteem intelligible, as well as the dislike of reproach.

In some minds this desire grows to remarkable intensity. All the great movements of history,—military, political, ecclesiastical literary,—bring out men in whom the love of fame is a strong passion. Though ethically not the highest principle of action, it becomes valuable as an aid to more purely ethical motives in that happy coincidence when fame points in the direction of duty.

“ Not once or twice in our fair island-story
The path of duty was the way to glory.”*

In truth, the love of merited praise acts as a not inconsiderable stimulus in the better class of minds; and insensibility to the esteem of others is an evidence either of extraordinary elevation or of equally extraordinary degradation. With truth, therefore, Milton may speak of fame as “the last infirmity of noble mind.”

An aspiration, having its root in the love of esteem, enters into the religious consciousness in the form of a desire to *please* God, and win His *favour*. It is such a serene aspiration that Milton has in view in that glorious passage of *Lycidas*, from which a familiar phrase has just been cited,—

“ Fame is no plant that grows on mortal soil,
Nor in the glistening foil
Set off to the world, nor in broad humour lies,
But lives and spreads aloft by those pure eyes
And perfect judgment of all seeing Jove.”

* Tennyson's *Ode on the Death of Wellington*,

There are two remarkable evidences of the strength of this desire in human life : one is the desire of an esteem which we can never enjoy ; the other, the desire of an esteem which we do not deserve.

1. The love of posthumous fame cannot, from the necessities of life, be a prominent feeling in the human mind ; but it is by no means an unknown experience for men to find pleasure in the imagined praises of posterity. Indeed, some writers of the present day maintain that a similar feeling,—the feeling of satisfaction at anticipating in fancy the beneficent results of our influence on posterity,—may take the place, as a motive in human life, of the Christian faith in immortality.

2. But it is perhaps a more striking proof of the strength of the craving for esteem, that, when men are unable to secure it by desert, they are eager to win it by any means, rather than lose the gratification it affords. This eagerness appears in two forms. It may be a desire to get esteem for things that are not estimable, as implying no merit on our part. Such is the vanity of personal appearance, of family connection, of dress and other external displays of wealth. Or, again, this desire may seek esteem for qualities which are estimable, but which we do not possess. Such are the intellectual vanity of the ignoramus, and the moral vanity of the hypocrite.

All the self-regarding emotions imply the presence in consciousness of an ideal by which we judge ourselves, whether this be the good opinion of others, or some abstract standard of goodness. All men are apt to have forced on them the contrast between this ideal and their actual attainments ; and the feeling of this contrast is humility.

§ 3.—*Feelings for Others.*

The largest and most varied class of our likings and dislikes are those which relate to other persons. To these the term *affection* has been restricted by many of the older writers, and a distinction drawn between affections that are benevolent and those that are malevolent. In the ordinary use of language affection for a person is understood to mean benevolent feeling.

There is no class of feelings where the complications of our emotional life appear so intricate, and baffle so completely all attempts at an exhaustive analysis, even by the most cautious and laborious science. Literary art, using as its favourite material the interests of human life, and obliged to represent these in all their concrete variations, is more successful in giving descriptions, and perhaps even analyses, of the affections than can be drawn by the abstractions of science. It is true, that the general source of affections is not hard to trace. It is to be found in the fact, that pleasure and pain can be derived, not only from external nature and from ourselves, but also from other persons. The vast variety, however, of the circumstances on which affection depends, and the complexity of their endless combinations, place their emotional effects altogether beyond the range of the most skilful analysis. We may enumerate facts both in the inner and outer life of men, by which our feelings are excited or modified. We may remind ourselves, that even circumstances, like rank, wealth, nationality, party-connection, and other social relationships, wholly intrinsic to an individual, may alter entirely our affection for him; that we receive some of our most powerful influences from external features like beauty or ugliness of figure, of manner, or of dress

itself; that, in instances of rarer culture, we seek our emotional stimulants mainly in the intellectual or moral character and achievements of others. We may also keep in view the fact, that some of the most passionate affections are based on no more solid ground than mere fancies. But were a complete enumeration of the causes of emotion possible, it would still be necessary to keep in mind, that their influence is greatly modified by each individual's general susceptibility and by its varying moods. The truth is, that the multitudinous aspects which a human being may present to the mind, and the multitudinous modes in which these may affect us, far surpass in number and variety the influences exerted by any object in nature; for while man is a natural product, he is something infinitely more. The result is, that he is capable of awakening all the emotions which are due to natural objects, with many others of a more subtle character that are peculiar to himself.

Among the influences which may be specially noticed as giving a tinge to our affections, prominence should be given to the feelings of others, so far, of course, as these can be read in their outward manifestations. Here the analysis of psychologists and moralists has been singularly imperfect, when contrasted with the achievements of dramatic skill in the literature of history and fiction. It has been too often assumed that the feelings of others excite always kindred feelings in ourselves, that their pleasure pleases, and that their pain pains us. This is an amiable assumption, but the darker phases of human life forbid us to regard it as true. Both the pleasures and the pains of others exert a complex emotional effect. Even if we set aside obscurer feelings, such as wonder, novelty, fear, contempt, which often impart a peculiar shade to our affections, it still remains an important fact

that fellow-feeling is not the only emotional state excited by the pleasures and pains of others. Along with this sympathetic effect there is another which by contrast may be called antipathetic. Before we proceed further, therefore, this subject demands a careful investigation.

I. We shall take first the *sympathetic* effect. In its generality this emotional phenomenon is most unequivocally expressed by the term *fellow-feeling*. The needs of human life make fellow-feeling with the sufferings of one another by far the more important exercise of this emotion. This circumstance explains the fact in language, that, while we have several terms to express fellow-feeling with pain, there is none restricted to the specific expression of fellow-feeling with pleasure. On the one hand, there are such terms as *pity*, *commiseration*, *compassion*, *condolence*; and even *sympathy* itself is most frequently employed with the same limitation. On the other hand, words, like *congratulation*, *complacency*, *complaisance*, which signify literally fellow-feeling with pleasure, have all received a somewhat different meaning.

Of fellow-feeling in its widest sense the source is the same as that of imitation.* Both imply the reproduction by ourselves of what is apprehended outside of ourselves. Of this imitative or sympathetic tendency an instinctive basis is perhaps to be found in an unconscious agency of the nervous system. We do not allude to those instances, in which one member is said to *sympathise* with another in the same organism, as, for example, eye with eye or ear with ear; for these have no natural affinity with the phenomena of sympathy,

*In common language *sympathy* is applied to the reproduction rather of the feelings of others, *imitation* to the reproduction of their movements. See Bain's *The Emotions and the Will*, p. 172.

properly so called. But it is a familiar fact, that the sight of tears, the sound of a sob or wail, tends, by an automatic impulse, to excite tears, sobs or wailing in ourselves. A yawn or a smile by one person may set a whole company yawning or laughing; and you may see a crowd of gaping rustics swaying their bodies in correspondence with the admired movements of an acrobat. Children may even be heard at times responding, in the same unreflective way, to the bark of a dog, the bleating of a sheep or the crowing of a cock. How far these imitative or sympathetic instincts are the result of education in the individual or in the race, it is impossible to say with certainty.

But these automatic movements do not yet constitute fellow-feeling. To reproduce in our consciousness the feeling of another person requires that we should apprehend what this feeling is. Consequently, fellow-feeling is impossible without a certain act of intelligence, and it is not difficult to understand why the required act of intelligence should be associated with this emotional accompaniment. This will be most clearly seen by referring in the first instance to the lower order of feelings. When I represent any sensation,—a touch, a sound, or a colour,—the representation is evidently but the revival of the sensation in a fainter degree. It is a well-known fact even that the representation implies a revival of the same sort of nervous thrill, by which the organ was stirred during the original sensation. In like manner, when a muscular movement is represented, a faint twitch is started in the same muscular region which the original movement called into play. Now, a large number of the pleasures and pains of others, with which we feel sympathy, are sensations; and the sympathy felt is simply a fainter revival in our own organism of the

pleasurable or painful sensations which others are conceived to feel. It is thus that all men, even of moderate sensibility, on observing another person suffer a severe bodily injury, are apt to feel a pang shoot through the corresponding part of their own bodies; and many are unable to look at serious wounds owing to their vivid realisation of the pain endured.

Apply all this to pure emotions. These can be made known to us, of course, only by their expression in language or by some other form of bodily manifestation. It is obviously requisite, however, that the expression of the emotion be intelligently interpreted by us; in other words, that we represent to ourselves, with some degree of distinctness, the emotion that is expressed. But the representation of an emotion is its revival in our own consciousness; and, consequently, the intelligent apprehension of an emotion felt by another person *is* a fellow-feeling with him. This analysis is confirmed by the fact, that in all the lower grades of culture the power of sympathy remains extremely rudimentary and restricted in its range, while its expansion keeps pace with the evolution of general intelligence. It is true, that human life, especially among civilised communities, owes many alleviations of its sorrows, and much even of the sweetness of social intercourse, to persons in whom a comparatively limited intelligence is combined with a remarkable quickness of sympathy. But it will be found that, however limited the general range of intelligence in such persons may be, it has been specially directed to the interpretation of all the familiar symptoms of suffering, and that, therefore, in the interpretation of these, it often outstrips intellects that have become famous by grappling successfully with the complicated problems of nature or of political or military affairs. On the other

hand, the dependence of sympathy on the intelligent apprehension of the feelings of others is strikingly evinced by the fact, that the finest emotional nature may at times be seen exhibiting an unpleasant callousness in presence of sufferings which it is unable to understand. For the wider reaches of sympathy require that constructive activity of intelligence which places us by imagination in situations which we have never personally tried, and enables us to construct out of the materials drawn from our own experience an ideal representation of the real experience of another. But this ideal construction is by no means always ready to command; and hence with all men sympathy is quickest and most intense in the case of those sufferings which are precisely similar to their own, while it becomes more sluggish and less vivid in proportion as the circumstances of a sufferer differ from theirs. Probably the highest development of sympathy is that which runs out readily to meet emotional experiences which cannot at the time be understood, which are realised merely as inexplicable sorrows or joys.

II. We now come to the less pleasing effect of an *antipathetic* nature, which is not to be produced by the feelings of others.

1. The *pleasures* of others are not ours; and, though this consideration may be overwhelmed in a generous sympathy, yet it may also at times force into consciousness the contrast between their pleasurable and our pleasureless condition. If this contrast is not banished from thought, but brooded over, it may give rise to the various forms of malicious feeling that come under the description of envy and jealousy.

2. On the other hand, the *pains* of others are capable of producing a twofold antipathetic effect.

(a) The contrast between ourselves and the sufferer

may excite a feeling of self-gratulation, which may even rise to a coarse exultation, over our own freedom from his misfortune. One of the most common forms of this exultation is met with in the ungenerous reflection on a competitor's defeat, which often gives a zest to the triumphs of successful rivalry.

(*b*) Again, the sight of suffering has often a varied pleasurable effect. It may relieve the languor of monotony, it may by its extraordinary nature startle with a pleasant surprise; while the contortions of the victim exhibit at times that character of oddity, which is the source of ludicrous effects. These emotional excitements are, in finer natures, generally supplanted by the vivid sympathetic realisation of the suffering expressed; but to coarse or morbid natures, that feed on such excitements, they bring a real, though horrid, pleasure. Savage life evidently derives one of its keenest zests from the torture of enemies; the scenes of the amphitheatre formed one of the most fascinating attractions to the populace of ancient Rome; a child bursts into boisterous fun over the wriggles of a mutilated insect; and even the most refined nature betrays a faintly malicious disposition in the occasional pleasure of teasing a friend.

It is evident from all these considerations, that a very large factor of our emotional life consists of the feelings excited by our fellow men. A very large proportion of that pleasurable excitement, without which human life would be intolerably dull, is derived from social intercourse. Accordingly, psychologists and moralists have long recognised the love of society as forming one of the most powerful feelings in the human mind. It is true, that in many minds,—perhaps in all minds at some time,—there is a love of solitude which seems to contradict the theory that the love of society is an inherent

craving of human nature. But society has its distractions, vexations, fatigues; and to those who have known these solitude is a relief. Still the life of the recluse is essentially a sacrifice of manifold pleasures, and has therefore been a favourite form of ascetic self-denial in nearly all religions. Fellowship is one of the most imperious wants of man, and the power of this want is pathetically illustrated in numerous stories of solitary confinement or enforced seclusion.

"Cast on the wildest of the Cyclad isles,
Where never human foot had marked the shore,
These ruffians left me; yet believe me, Arcas,
Such is the rooted love we bear mankind,
All ruffians as they were, I never heard
A sound more dismal than their ^{passing} oars."^{*}

But our emotional relation to our fellow men consists not merely of this general delight in their companionship; it assumes the form of specific affections for particular persons. It is equal, as already observed, to classify these in two great divisions as benevolent and malevolent; but such a division is apt, without explanation, to mis-

* Thomson's *Agamemnon*. Hobbes is usually represented as maintaining that the natural state of men is one of unsocial hostility; but this doctrine is often inadequately understood as implying that there is no basis for social existence in human nature. Hobbes does recognise certain natural impulses that attract men to friendly intercourse, and are more powerful than the "three causes of quarrel," namely, competition, diffidence, and glory. The only fault one can find with Hobbes' doctrine is the ludicrous incompleteness in his enumeration of man's social impulses. "The passions that incline men to peace," he says, "are fear of death, desire of such things as are necessary for commodious living, and a hope, by their industry, to enjoy them." (*Leviathan*, Part I., Chapter 13).

represent the concrete realities of our emotional life. The feelings we entertain for others are generally of a very mingled, often of a vacillating, character ; and now it is the benevolent, now the malevolent, factors that prevail. Still, if we bear this complication in mind, the division affords a convenient guide for more detailed examination of the phenomena. Here of course emotion follows the usual course of its development. It starts with those feelings which depend on purely natural associations, and expands gradually to those which imply an intelligent choice. Consequently, it will be found that the affections, both benevolent and malevolent, may be subdivided into two main types, the natural and the rational ; though here again it must be borne in mind, that our actual feelings seldom belong to either type exclusively.*

(A) *Benevolent affections* are the various modes, in which we find pleasure in other persons. They are called benevolent obviously because they seek their gratification in the real or imagined wellbeing of their objects, though it is an important moral truth that, without rational guidance, these emotional impulses often produce the very opposite effects to those which they seek.

In the very front of the benevolent affections we come upon one that may be regarded as forming the centre from which social life, and therefore also social feeling, radiate. Sexual love is an emotion *sui generis*, exhibiting

* This distinction was first drawn by Bishop Butler, and has been generally adopted by subsequent writers, in reference to the malevolent affections. See Butler's Sermon on *Resentment*. The distinction, however, is obviously applicable, with equal propriety, to the benevolent affections.

the characteristics both of the natural and the rational types. Psychologists have too generally treated it in the spirit of Dr. Reid, who declares that "it is fitter to be sung than said," and accordingly leaves it "to those who have slept on the two-topped Parnassus."* It is true, that this emotion has formed a favourite material of poetry; and the reason is probably to be found in the fact, that it is distinguished by an unusual combination of great intensity with great ideal power. Still this should render it only a more interesting subject of scientific analysis. The complete analysis of the emotion is, indeed, impossible. The truth is, that all the influences, by which one human being is capable of exciting amiable sentiment in another, are apt to be distilled into a finer essence of concentrated power in passing through the alembic of the sexual nature. Consequently this emotion may be modified into a thousand different forms according to the character of the influences by which it has been generated; and therefore literary art, by its concrete treatment, is always able to describe the love of the sexes with more of the truth of nature than can be given to the abstractions of science.

The peculiar character of this affection finds, of course, its natural basis in the difference of sexual constitution. A grossly inadequate view of this difference restricts it mainly to one set of organs; but as a true physiology and a true psychology look on no single organ, but rather on the whole organism, as being the organ of mind, so they compel us to regard the whole organism as an exponent of the difference of sex. The more thoroughly this view takes possession of the mind, the more

* Reid's *Works*, p. 564, Hamilton's edition.

thoroughly also does sexual feeling free itself from a mere animal appetite, and expand into that spiritual sentiment which forms at once one of the purest enjoyments and one of the purest moral influences of life. It has been maintained that this spiritualisation of the sentiment has been the result of mediæval chivalry; but this is a question which belongs rather to history than to psychology. Whatever may have been the history of this sentiment in the past, it must follow the general course of emotional evolution; and any reversion to the sensuous restriction of the feeling, such as occasionally makes its appearance among the eccentricities of literature, is not only an anachronism, but a solecism in art, as decided as if the poet were to seek the fittest material for the artistic description of a banquet in the animal gusto with which the viands are devoured.

I. Among the other benevolent affections, those which are founded on relationships of nature come appropriately first under consideration. The characteristic of these is determined by the fact, that they arise from natural associations, not from combinations of intelligence. It is not any rational consideration that directs them to their objects; it is simply the extrinsic associations of space and time. They appear, therefore, as blind instincts, as unreasoning passions, that cling to their objects without any reflection upon the intrinsic character of these.

1. Of such social instincts the type is to be found in what is called, by pre-eminence, *natural affection* (στοργή), that is, affection between persons of the same kindred. The passionate intensity of this affection is mainly determined by the closeness of the natural relation, out of which it arises; and consequently a mother's love has in all ages been regarded as among the most irresistible instincts of nature. Even within the sphere of the

family, as intelligence matures with age, natural affection is apt to be modified by rational considerations; while, outside of that sphere, although the natural relation may still have a powerful influence on the affections, these receive their colour, in a very large measure, from the character of their objects.

2. A natural affection is often developed towards a community, with which we are connected by natural causes. Wherever social organisation exists, this sentiment ennobles human life; it appears in the devotion of the savage to his tribe, in the attachment to a municipal home, in the patriotism with which men sacrifice themselves for a fatherland. The last fruit of nature's growth in this direction is that philanthropy,—that "enthusiasm of humanity,"—in which is attained an emotional realisation of the natural relationship of all mankind.

II. But such a late outgrowth of natural affection can scarcely be distinguished from the other form of benevolence; for this is but the extension to persons who are not akin to us of those affections which are naturally excited towards our own kindred.* This expansion of benevolent feeling, however, is but a mode of the general development of mind, which frees itself from the spatial and temporal associations of nature, rising into the independent combinations of thought. Affection tends thus to lose the passionate force of an unreflecting instinct, and to be distinguished by the deliberate calm of intelligent choice. This characteristic of the rational affections is expressively embodied in the Latin verb *diligere*, which

* This seems indicated in the adjective *kind*, which, like the substantive, is from the Anglo-Saxon *cennan*, to beget (cf. *kindle*), cognate with the archaic Latin *geno* (*gigno*), and the Greek γεννᾶω.

is properly limited to them, and which is suggestive of the cognate *intelligo* and *seligo*.*

Like the natural affections, the rational begin with attachments to individuals, and form the friendships of human life. But they, too, may extend to societies, that is, to societies which we enter by voluntary choice ; and it is thus that the sentiment of *esprit de corps* is created.

It is important to bear in mind, further, that when any rational affection for an individual or a society has existed some time it originates numerous associations which are apt to impart to it some of the passionate blindness of natural affection. This explains why the benevolent sentiment, which actuates the members of a society in common, may appear in relation to other societies, not only as a "generous rivalry," but also in the malevolent form of party-spirit or sectarianism.

(B) We are thus brought to the second great division of the affections,—the *malevolent*. The fundamental type of these is the emotional state named *resentment*. This term (originally *resentiment*) denotes etymologically *a feeling in return or again*, and was formerly applied to the sentiment excited in return for favours as well as to that excited by injuries. Now the term is restricted to the latter feeling,† and it forms a very appropriate name for

* The contrast of *diligo* with *amo*, which expresses rather the intensity of natural affection, is finely brought out in one of Cicero's letters:—"L. Clodius valde me diligit, vel, ut ἐμφατικώτερον dicam, valde me amat" (*Ad Brutum*, i., 1. Cf. *Ad Familiares*, ix., 14 ; xiii., 47).

† A similar restriction may be traced in the history of the word *retaliation* (Trench's *Study of Words*, pp. 54-5, 11th ed.) Trench regards these restrictions of meaning as due to a degradation from the standard of sentiment in the good old times. They are evidently rather the result of that differentiation which characterises the growth of all language.

the rebound of our emotional nature against injury. When this emotional reaction has fixed on its injurious cause, it becomes malevolent affection.

It has long been, and continues still to be, a moot question among psychologists, whether there is any feeling of pure malevolence in the human mind.* The controversy is perhaps owing to a want of distinctness in the use of terms. What is meant by pure malevolence? As commonly used, the word must be understood to mean either pain felt solely on account of another's pleasure, or delight in another's pain, considered simply as pain. Now, the explanation of sympathy given above implies that malevolence or antipathy in this sense would involve a subversion of the very constitution of the human mind. The sentiment of sympathy is merely the emotional side of that mental act, which on its intellectual side is an apprehension of the feelings of others. Consequently the conception of another's pain, purely as pain, is the revival of the pain in our own consciousness; and a delight in pain pure and simple is, therefore, out of the question.† The same remark applies to dissatisfaction with another's pleasure. At the same time it has been shown that the feelings of others are accompanied with adjuncts which afford a sufficient basis in our nature for

* A recent debate on the question will be found in a paper by Mr. F. H. Bradley, in *Mind* for July, 1883, with a reply by Dr. Bain in the following number.

† Even Hobbes, with all the repulsive egoism which generally characterises his psychology of the emotions, saw clearly this truth. After defining *cruelty* as "little sense of the calamity of others proceeding from security of men's own fortune," he adds:—"For, that any one should take pleasure in other men's harms, without other end of his own, I do not conceive it possible." (*Leviathan*, Part i., Chap. 6.)

malevolent antipathy ; so that practically the result is the same as if we were capable of being pleased with the pains, and pained with the pleasures of others.

I. At its lowest stage malevolence, like benevolence, is excited by mere associations of nature ; it is a purely animal instinct, a blind passion, like natural affection. Its stimulating cause may, therefore, be any accidental harm—anything innocently offensive—such as even an inanimate object. Occasionally in civilized life this unreasoning outburst of resentment may be observed, as when a man, in instinctive anger, kicks a stone against which he has inadvertently struck a tender toe. But it is in savage life, or in situations like a battle in which the restraints of civilisation are snapped asunder, that the instinct exhibits its most appalling power. Savages have been seen tearing an arrow from their lacerated flesh, and biting it in rage. Commodore Byron saw a native of Tierra del Fuego snatch up in fury his own child, who had accidentally dropped a basket of eggs, and dash the little fellow against the rocks with such violence that almost immediately afterwards he died.*

II. But resentment loses the passionate force of a natural instinct, when intelligence is called into play. It then requires something more to rouse it than mere harm ; it requires an intentional injury, supposed, if not real. The injury need not, indeed, be inflicted directly on ourselves. If borne by another, it may by sympathy become an injury to us, and thus excite resentment. Such representative resentment is usually called *indignation*.

Resentment, whether instinctive or rational, may be

* Lubbock's *Prehistoric Times*, p. 560. Other examples will be found in Tylor's *Primitive Culture*, Vol. I., pp. 259-60.

modified by numerous influences ; and thus it gives rise to the specific forms of malevolent affection, by which human life is disturbed. Like benevolence, it may attach itself to individuals or to communities.

I. Among the malicious affections for *individuals*, envy and jealousy are the most common. Both originate in the same antipathetic emotion—the feeling of pain which is apt to be excited by contrasting the pleasures of others with our own want of their pleasures.

1. *Envy* is usually described as a malevolent outgrowth of rivalry ; but it may arise in circumstances in which there is no explicit competition with others. Still it finds its most natural stimulant in competitions, especially when the object is one of merely relative value. When outstripped by another in the pursuit of any such object, we are apt to feel hurt by his success ; and envy, in so far as it implies malevolence, is the resentful passion thus excited. This analysis is confirmed by the fact, that the word *envy* is often used without malevolent implications, but always with reference to a pleasure which we are not enjoying ourselves, as when one friend says to another, “I envy you your privileges,” etc.

In connection with this subject a distinction has been drawn between objects of pursuit which are of absolute value, such as intelligence or virtue, and those which are of relative value—which are of value to any one merely in comparison, or rather in contrast, with the degree in which they are possessed by others. The vulgar craving for wealth, fine clothing, splendid equipages, palatial residences, popular applause, is largely a mere wish to have something more or better than one’s neighbours ; and there is often all the annoyance of baffled endeavour when the object has been gained by so many as to be no longer distinctive. Pursuits of the former class are

spoken of as generous, because in them the successful enjoy their success only the more, the more that others partake of the same boon. It is in pursuits of the latter class that envy naturally arises.*

2. *Jealousy* arises similarly under the influence of an affection which can be gratified only by its return. When another wins the love which we have expected, we feel hurt; and our resentment of this injury constitutes jealousy. This passion may be felt in the case of any affection. Thus it may form a just resentment in the case of a parent, from whom a child's love has been withdrawn by some third person.† But jealousy is most common and most powerful in connection with sexual love, partly because of the intensity of this affection, partly because with it, more than with any, the success of one rival inevitably involves the defeat of another, and a defeat often entailing the keenest emotional anguish of which the human mind is susceptible.

3. The malevolent affections of envy and jealousy are effects of failure in a competition; but success often brings with it a kind of malice as well—the malicious pleasure of feeling our success enhanced by relief against the failure of a beaten rival. It is a startling fact, that not a few divines, in describing the joys of heaven, have attributed to the blessed the gratification of gazing into

* This distinction is finely illustrated by Ferguson, *Principles of Moral and Political Science*, ii., 1, 7.

† Xenophon draws a parallel between marital and paternal jealousy, in *Cyrop.*, iii., 1. Possibly it was in part to the paternal jealousy of Anytus, that Socrates owed his death. In the strong Eastern imagery of the Old Testament, God is described as jealous when His creatures give to other objects the love which He alone may claim.

the nether world, and glorying that they have escaped the sufferings of the damned.

"Tantaene animis coelestibus irae?"

II. Strangely enough, the malevolent passions, by which communities are separated, have their origin in the benevolent affections, by which each community is held together. The attachment to any society on the part of its different members is apt to produce a social selfishness, which may be as baneful in its effects as the narrower selfishness of individuals. It is thus that all sectional loves are perpetually generating sectional hatreds among men. The malicious enmities of political parties and of religious sects, "the feud of rich and poor," the hostile feelings of different nations, or even of different provinces and municipalities in the same nation, are instances of restricted hatreds growing out of restricted loves. As the relations of a man to the other sex may sometimes be peculiarly unfortunate, it is not unintelligible that misogyny should be an occasional phenomenon among human feelings. Even misanthropy is not inexplicable. When a man has been signally unfortunate in the world, when his misfortunes have been caused by the villany of others, and solaced by no generous help, the emotional nature may receive such a twist, as to make it insensible to the pleasantness of human character, sensible only to its irritations, while the judgment may be so warped as to create a thousand imaginary causes of irritation, where there are none in reality to gratify the distorted sensibility.

It seems necessary to add one word on revenge. What is understood by this term is an action rather than a feeling; it is an action done under the impulse of

malevolent passion, not under the guidance of reason. The highest morality, therefore, reprobates revenge ; but it should be borne in mind that no action, done under the mere impulses of nature, is moral, and that any emotion, even benevolence, may lead to disastrous results, if allowed to control our conduct without rational direction.

CHAPTER III.

FEELINGS ORIGINATING IN COMPARISON.

AS in the class of feelings, to which the previous chapter is devoted, the prominent fact is the association of pleasures and pains with their objects or causes, so in those, to which we now proceed, the other mental process, comparison, is the determining feature; in other words, they are the emotions that arise from a comparison of their objects with other objects. As this involves the relation of objects in consciousness, the feelings in question have been called *feelings of relativity*. This name may appropriately embrace a larger range of emotions than it is sometimes used to denote; it is, in fact, applicable to all emotions that arise from an object being thought under any relation. All objects, indeed, must be known under relations; but the relation of an object need not be the obtrusive phenomenon in consciousness. When it is so, it is calculated to excite emotions that vary in kind with the nature of the relation concerned, in degree with the intensity with which the relation absorbs the consciousness.

The most easily intelligible relations are those of space and time. Spatial relations, by themselves, do not seem competent to excite emotion; for it need scarcely be pointed out that the feelings excited by

movement involve the relation of time as well. The feeling, too, of vastness in extent, awakened by an immense landscape, or, still more, by the infinite spaces of the stars, derives its peculiar nature rather from the idea of sublimity than from that of space alone.

Time enters as a subordinate factor into many of our emotions ; but we must limit ourselves to those, in which it is the distinctive element. Here meet us first the emotions already noticed, the feelings of movement, which have a spatial element in their primitive form, but throw that off in what has been called the "ideal movement" of music and speech. Here abstract rapidity and slowness produce pleasant or unpleasant effects, without reference to any change of place.

Another class of feelings arising from temporal relations are those which have been called the prospective and the retrospective. The prospect of pleasure is, on its emotional side, hope ; the prospect of pain is fear. But the uncertainty of the future often leaves the mind in that state of suspense, in which hope and fear strangely alternate or conflict with one another.* This state is undoubtedly one of the most exhausting to which our emotional nature is subject ; and possibly its painfulness may be due to the fact that, like discordant sounds and other feelings noticed before, it consists of a series of intermittent shocks, the intervals of which allow the sensibility to recover, and thus to undergo an excessive stimulation.

* "Spemque metumque inter dubii" (*Aeneid*, i., 218), which Byron probably had in his eye when writing *Don Juan*, ii., 98 :—

"And then of these some part burst into tears ;
And others, looking with a stupid stare,
Could not yet separate their hopes from fears."

On the other hand, the retrospect of past pleasures has long been considered as one of the largest and purest sources of human enjoyment. For, in accordance with laws of feeling which have been sufficiently explained already, it is easier to reproduce in consciousness a state of invigorating pleasure than a painful condition of injurious excitement; and therefore in general for all

" — the past doth win
A glory from its being far,
And orbs into the perfect star
We saw not when we moved therein."

There is, indeed, no distinctive name for the emotional state excited by the pleasures of memory; but the painful events of the past are the sources of the emotion familiarly known as regret.

Both the prospective and retrospective feelings enter extensively as modifying influences into our emotional life. Our loves and hates, for example, are deeply tinged by hopes and fears; while regret becomes aggravated into remorse when the painful event, on which we reflect, is thought as due to any moral fault of our own. This may explain why a psychologist, like Dr. Thomas Brown, should be able to classify a large proportion of our emotions under the heads of prospective and retrospective.* 'Tis true, it may be shown that in all the feelings thus distinguished a prospect or retrospect is implied; but in most this element is not the differentiating cause which gives its character to the feeling.

But the universal relations of intelligence are, as we

* *Lectures on the Philosophy of the Human Mind*, 63—72 inclusive.

have seen, those of identity and difference; and these give rise to a long series of varied emotions. Such emotions have not always separate names. Sometimes it is the pleasant, sometimes the unpleasant, side which is most prominent in human life, and which is accordingly distinguished by a familiar name. The most common of these emotions may be briefly described.

I. Variety, as has already been noticed more than once, is essential to the continuance of consciousness itself. It is, therefore, essential to that stimulation of the sensibility which is required for pleasure. Consequently the prolonged repetition of the same mental state produces the unpleasant feeling known as *monotony*,—a feeling which is capable of completely neutralising any form of enjoyment.

II. We may enjoy a variety of impressions that are all familiar; but even the repetition of such a variety produces at last a feeling akin to monotony,—the feeling of excessive familiarity or staleness. This is relieved only by the presentation of *new* objects to the mind. Novelty supplies the wanted stimulus to the sensibility, and is therefore a well-known source of agreeable effects.

III. Familiarity implies the repetition of the same objects; but a similar effect on the feelings may be produced by the continued presentation of the same kind of objects. This is the disagreeableness which we associate with anything extremely commonplace. On the other hand, any object, which is not so much individually a novelty, which rather differs wholly from the kind of things to which we are accustomed, excites the emotion of wonder. This emotion is sometimes too intense to be pleasant. An excessive deviation from what we are used to expect may lead to disappointment, to painful astonishment. In extreme cases a marvel may even pro-

duce the effect of other excessively powerful stimulants ; it may deaden the sensibility : we may be astounded, dumbfounded, stupified.* But this feature of objects is, perhaps more frequently, the source of a pleasant surprise. Its pleasantness is illustrated by the power which the love of the marvellous exercises over the mind. Not only is the marvel-monger a favourite among vulgar minds ; the same passion often induces the scientific student to accept without hesitation ill-verified assertions regarding natural phenomena of a marvellous kind, while it also forms at times a misleading taste in the literature of history and fiction.

IV. Resemblance and contrast are additional modifications of identity and difference. As already explained, resemblance is identity in the midst of difference, while contrast is difference in the midst of identity. These relations are the source of various emotions, generally of an agreeable nature. A contrast may sometimes be too violent for pleasure. This is, in fact, the cause of painfulness in extreme astonishment or novelty. But more generally the flash of contrast, and probably always the flash of resemblance in consciousness is an agreeable stimulus. They both enter largely into the pleasures of scientific discovery and artistic invention. The development of science is a progressive insight into the resemblances and contrasts that pervade nature, while agreeable devices of literary art, such as the common figures of speech, are founded on the emotional effects of similitude and antithesis.

* It is worth observing that, at times, though less frequently, excessive variety is fatiguing, and excessive novelty (brandnewness) too striking ; so that occasionally a moderate sameness or familiarity may form a pleasing relief to the mind.

V. When identity and difference are applied to time, we get the relations of periodicity and aperiodicity, of rhythm and irregularity of movement; for these relations imply respectively the recurrence of identical and of different times. Even in the feelings of sense the organism appears adapted to rhythmical stimulation. As already explained, it is this adaptation that makes tones agreeable in contrast with noises, rich in contrast with harsh qualities of tone, and harmonious combinations of tone in contrast with discords. It may also account in some measure for the disagreeableness of a flickering light, of false time in music, of a false quantity or metre in the recitation of poetry, of false steps in a dance, of an unsteady gait, of any movement by jerks, of an orator who speaks in spurts. It is not easy to say where, in such cases, sensuous feeling ends; but it is evident that in the higher feelings also rhythm mingles as an emotional agent. It enters especially, as an influential factor, into the enjoyment of poetical and musical form.

VI. Another set of relations involving identity and difference are those of harmony and discord, understood in the figurative application of these terms. In their most general use these terms may be interpreted as implying an identity or difference of relations, as when two objects do or do not form complementary parts of one whole. Such identity and difference is, therefore, what we understand by the various expressions, order and disorder, proportion and disproportion, symmetry and asymmetry, congruity and incongruity.

The relation, denoted by the former term in each of these sets of expressions, is a very extensive source of the more refined enjoyments of human life. It enters largely into the varied forms of æsthetic gratification

which we receive from nature and from all the arts, while the vast cosmic order gives in cultured minds a tone to the religious sentiment. The other relation is of interest perhaps chiefly because it forms the basis of the ludicrous.

The sentiment of the ridiculous has given rise to almost as great diversity of opinion as the feeling of beauty. Various qualities in objects have been maintained to be the sources of ridicule. Incongruity, meanness, degradation accompanied by the feeling of power or self-exaltation, have all found their advocates. Against each of these qualities instances have been cited, where, not ridicule, but some other emotion,—pity, anger, scorn, &c.—has been excited.* Such criticisms overlook the fact that there is a subjective as well as an objective condition of feeling. The emotional effect, therefore, of any objective quality cannot be told without knowing how the mind is related to that quality at the time. Thus incongruity will excite ridicule, if it is not counteracted by the mental condition of the moment. But an incongruous object may often be viewed in other aspects; and consequently it may produce different feelings in different minds, or even in the same mind at different times. Take, for example, the odd contortions of pain, or the comical behaviour of a drunkard. When viewed exclusively on their droll side, these phenomena will assuredly excite the sentiment of the ridiculous; but that side may be entirely obliterated in minds of deeper insight or more sympathetic tenderness. On going over ridiculous objects no more prominent characteristic than incongruity can be found universally present. Other qualities, such as degradation, with the relief of self-exal-

* See, for example, Bain's *The Emotions and the Will*, pp. 248.

tation, may be frequently, perhaps commonly, met with ; but even if they could be shown to be uniformly there, in the production of ridicule they are altogether subordinate to the relation expressed by such terms as disproportion, incongruity, oddity, drollness.

VII. The feelings of freedom and restraint have also been enumerated among those that are based on comparison ; for it is only by relation to each other that these conditions have any meaning in consciousness. Were it not for the fact that human life provides all men with an occasional experience of the irksomeness of restraint, the glory of freedom would never be realised ; and without a taste of freedom it is proverbial that the slave will "hug his chains."

VIII. Emulation, that is, the emotional excitement developed in competition, is obviously due to a comparison between the subject of the feeling and his rival or rivals. This feeling undergoes, of course, the same kind of expansion to which mental evolution in general is subject, and therefore it manifests itself in a great variety of directions. It also enters extensively as a factor into many of the complex emotions, inasmuch as the activities, by which our sensibility is excited, are very often pursuits in which we are, implicitly or explicitly, competing with our fellowmen.

CHAPTER IV.

INTELLECTUAL FEELINGS.

OUR pleasures and pains are the concomitants of the varied activities of life. Now, our activities may be regarded as either cognitional or volitional, as intellectual or practical; and there are some feelings whose chief determining cause is an activity of the one or of the other kind. In the present chapter we shall examine the intellectual, and in the concluding chapter the practical emotions.

The acquisition of knowledge is the source of many and varied enjoyments. There is scarcely one of the pleasurable feelings described in the previous chapter which may not be at times experienced in intellectual pursuits. The exertion of intellect, when not overstrained, is in itself an agreeable activity; while self-esteem, the esteem of others, the pleasure of power, and other feelings may enter as subsidiary factors of the whole enjoyment. It is not, therefore, difficult to explain the love of knowledge—the feeling commonly treated by psychologists under the name of *curiosity*. During the earlier years of life, until the familiar facts of the world are mastered, curiosity forms a strong and useful impulse. In later life it is only among men of some education that it forms a useful and refining power. In vulgar minds it allies itself with the more petty instincts, and

even with the malicious passions of human nature, degenerating into a prurient craving after the knowledge of facts too trivial or too pernicious to be worth knowing.

It thus appears that the use of the intellect in acquiring knowledge is a source of numerous pleasures. Generally, however, the emotional factor of intellectual work is subordinate, the consciousness being absorbed in the primal end of the work, the object to be known. This end may be purely speculative—the acquisition of knowledge for its own sake ; or it may be practical—the acquisition of knowledge for the purpose of directing us to some ulterior result. But in either case it is the object sought that engrosses the conscious effort. Sometimes, however, the end of intellectual activity is neither speculative nor practical, but simply the delight in the activity itself, not excluding, of course, any collateral pleasures which it may involve ; and then arises the emotional state known as æsthetic feeling.

The nature of this feeling has been already indicated in the chapter on Idealisation.* It was there shown that intellectual activity, to be æsthetic, must be of the nature of *play*. But play is an exercise which seeks no end beyond its own pleasure ; and therefore æsthetic enjoyment is found in the intellectual activity itself, out of which it arises, not in any ulterior end. It follows from this, that æsthetic gratifications are distinct from selfish pleasures, on the one hand, and from moral interests on the other.

I. They are distinct from all selfish enjoyments—all enjoyments connected with the struggle for existence. Hence,

* Book. ii., Part ii., Chapter iv.

1. Some sensations, such as the gustative and the alimentary, are wholly excluded from the æsthetic field. In fact, sensation as such—mere sensuous excitement—is, strictly speaking, not yet æsthetic. The higher sensations furnish natural materials for the æsthetic consciousness; but they yield a purely æsthetic pleasure only when they have entered into suggestive associations and intellectual combinations. Accordingly it was shown that the different sensations are adapted to artistic purposes in proportion to their distinct representability. Æsthetic material, being thus found rather in ideal representations than in actual sensations, can be enjoyed by many; it is not consumed in being enjoyed by one. The enjoyment is, therefore, essentially unselfish, disinterested. The contrast between selfish and æsthetic gratifications is extreme, when we compare the pleasure of merely viewing a tastefully decorated banquet with the pleasure of eating the viands. The unselfishness of æsthetic emotion, therefore, constitutes also its refinement; for refinement, as previously explained, is the power of freeing consciousness from mere sensuous states, and occupying it with mental products.

2. But even ideal representations, to be æsthetic, must be absolutely disinterested. Beautiful objects may at times naturally excite meaner passions like envy, jealousy or vanity. A bitter drop of envy or jealousy is often sufficient to neutralise all the sweetness of æsthetic feeling; an artistic production, that is known to be a vulgar parade of wealth, may fail to achieve the æsthetic effect that might have been expected from its intrinsic merit. If a work of art implies wealth in its possessor, it is not this fact which fits it for yielding æsthetic gratification. In the same way, although the useful may be beautiful, it is so, not because it is useful, but because of

the intellectual pleasure afforded by contemplating the manner in which it is useful.

II. But æsthetic feeling is essentially distinct from all moral interests, as it is from the selfish passions of the struggle for existence. Moral activity supposes an ulterior end ; in fact, it supposes an implicit reference to the ultimate end of our being. Consequently it stands related to art in the same way as the production of utilities. Art may be moral as it may be useful, and its æsthetic effect may be enhanced by its morality or by its utility. Nay, the artist, being a moral agent, must have some sort of moral aim in his artistic activity as in other spheres of his conduct. Moreover, the object of art being the production of an intellectual pleasure, the artist dare not overlook the value of the moral sentiments, as any flagrant offence to these would inevitably defeat his æsthetic aim. Still the æsthetic gratification, which a work of art yields, cannot be derived from the fact that it has a moral purpose. This fact would excite the sentiment of moral approbation. The æsthetic pleasure is derived from contemplating the manner in which the moral facts of life are combined for the production of an artistic effect.

The pure form of æsthetic pleasure is that expressed by the term *beauty*, and pure æsthetic pain is *ugliness*. But, like other emotions, these admit of numerous modifications according to the subsidiary influences which may happen to predominate in the artistic material by which the æsthetic effect is produced. In works of psychology and æsthetics it is common to give prominence to the feelings of sublimity, in which æsthetic enjoyment is just passing over into the disturbing emotions of wonder and awe and power. The picturesque and the ludicrous are also familiar objects of æsthetic pleasure. In the former, the pure æsthetic feeling is modified by

an excess of variety ; in the latter, by an excess of incongruity. In strictness, however, æsthetic feeling is much more variously modified than it is commonly represented to be. The weird, for example, in which the mysterious, the "uncanny," the supernatural plays a prominent part, has, indeed, a certain affinity with the sublime in the common feeling of awe, but is destitute of its other essential factors.* A distinct place ought also to be given to the tragic, in which the painful emotions, especially terror and pity, form the chief æsthetic material, and also to the dramatic, in which æsthetic effects are based mainly on plot-interest.

But the complete analysis of these various æsthetic effects would carry us into the details of the science of æsthetics.

* The feeling of the weird is expressed in the Scottish adjective *weird*.

CHAPTER V.

FEELINGS OF ACTION.

IN the general evolution of mental life volition, that is, action in the strictest sense of the term, is called into play ; and the action, as action, gives rise to various feelings, pleasurable and painful.

There is a pleasure in mere action,—a pleasure which, at an earlier period of life, displays itself mainly in the love of muscular sports, and during later years gives a zest to the varied industrial, intellectual, and moral activities of men. But all action, strictly so called, implies an end ; and this circumstance constitutes it a more fruitful source of emotion.

I. The attainment of any end gives us the pleasure of feeling that it is within our power, as failure to reach it excites the mortification of powerlessness, of baffled endeavour. In this we have the source of ambition, the love of power, which obviously forms an extensive and varied influence in human life. If in younger years, and in many men to the very last, it shows itself only in the pleasure of producing results of bodily strength or skill, it expands under advancing culture into the aspiration after that power which high intelligence wields over nature and men. It has been pointed out that this emotion enters as an ingredient into the pleasure of virtue, inasmuch as the virtuous life is a realisation of

complete power over self, not to speak of the influence it may exert over others. But the love of power seems also to add force to the cruel side of human nature; nothing yields such a vivid consciousness of our power over another as his subjection to our torture.*

II. But without evoking the definite feeling of power, the presence of an end may kindle a more or less eager desire for its attainment. This eagerness takes sometimes an egoistic, sometimes an altruistic, direction. 1. In its egoistic form it originates the pleasure of pursuit, the pleasure of approximating to the end of an action to the ideal of a life. 2. In its altruistic form this emotion arises from contemplating the activity of others, and the development of its results. We thus obtain that large element of literary gratification, the pleasure of plot-interest.

III. As each action supposes an end, so each subordinate end supposes some supreme end, to which it is merely a means. All the immediate ends or human actions, therefore, point to a chief end of man, a *summum bonum* of his life. The pleasures connected with the pursuit and attainment of this end, the pains connected with the failure to reach it,—these enter as prominent factors into the moral sentiments.

* Stewart has given a specially interesting illustration of the numerous directions of the love or power in his *Philosophy of the Active and Moral Powers*, Book i., Chap. ii., § 4.

PART III.

VOLITIONS.

VOLITIONS are actions consciously directed to an end ; and the problem of psychology is to explain the process by which we acquire control over our actions so as to make them subserve the ends we have in view, instead of being aimless. In the treatment of this problem we shall discuss (1) the nature of volition, (2) the motive power of the feelings, (3) the extension of voluntary control over muscles, feelings, and thoughts, (4) freedom of volition.

CHAPTER I.

THE GENERAL NATURE OF VOLITION.

HERE, as in cognition and feeling, the rudimentary material of the mental life is to be found in sensation,—here considered as giving, not information or pleasure and pain, but impulse to action. There are indeed impulses outside of conscious sensation. There are possibly, as a favourite doctrine of Professor Bain holds, spontaneous discharges of surplus muscular energy.* Certainly stimuli transmitted along afferent nerves are often reflected along efferent nerves without exciting consciousness. These spontaneous and reflex muscular movements are moreover not without value in the development of voluntary movements; but they are by no means so valuable as those experiences, in which movement follows, though involuntarily, upon a conscious sensation. Thus we close the eyes, or turn the head away, from a dazzling light. We shrink or scream or groan under an excessive pain. The hand plays tenderly with any smooth soft body which it touches. We are constantly shifting to relieve the uneasiness of a posture maintained too long. In a thousand ways the

* *The Senses and the Intellect*, pp. 59-73; *The Emotions and the Will*, pp. 297-308.

feeling of pleasure, perhaps more frequently the feeling of pain, discharges itself in excitements of motor nerve. The movements, thus involuntarily stimulated by sensation, are observed very strikingly in the changing positions of the sleeper, when he is disturbed. It is not possible always to distinguish such movements from strictly reflex actions ; but the distinction is real.

When an action is thus involuntarily performed, whether by a spontaneous or reflex or sensational stimulus, it may be the cause, directly or indirectly, of pleasure or pain. In fact, most of our pleasures and pains imply some action on our part. We speak of *objects* being the causes of our feelings ; but objects must be brought into the proper relation to our organism to excite its sensibility. Thus a beautiful scene must be looked at ; a sapid body must be put into the mouth, an odour must be sniffed, before the appropriate feelings can be experienced. The action therefore comes to be associated in consciousness with the pleasure or pain it produces ; and, as already explained,* it is thus that likings and dislikes are aroused. The association of action and feeling makes them mutually suggestive. The feeling, therefore, whether actually felt or merely remembered, will suggest the action, by which it is produced ; but an action,—a muscular movement,—cannot be represented in consciousness without a faint thrill in the muscular region which would be stirred if the movement were actually made. This thrill of representing an action in connection with a pleasure to be reached or a pain to be avoided by it,—this is that conscious state of desire, craving, longing, yearning,

* See Chap. ii. of the previous Part.

which has been well named "the small beginnings of action."*

This mental state finds its most vivid and familiar illustration in the earliest form in which it shows itself in human life—our animal appetites. The term, appetite, when used in its most restricted sense, is applied to those periodic cravings which arise from the recurring wants of animal nature. Of these it is common to distinguish two kinds—one as being natural and original, the other as artificial and acquired. The latter are simply particular habits imposed on the nervous system by the peculiar indulgences of individuals. Such are the cravings for alcohol, tobacco, opium, tea, flesh, spices, and other stimulants or narcotics. Appetites of this sort are of course not universal impulses of the human mind, but are mere accidents of individual life. On the other hand, the natural or original appetites have their source in the intrinsic wants of our animal constitution, and are therefore common to all men. The most obtrusive of these in daily consciousness are those most closely connected with the struggle for individual existence, hunger and thirst. But, in addition to these, the sexual organic cravings, the craving for sleep, the cravings for activity and rest, and perhaps some other bodily desires of a more obscure character, are also to be included among natural appetites. These earliest and simplest forms of desire remain throughout life the types of all the more complex longings of the mind. In common language the terms *hunger* and *thirst*, in particular, are extensively applied to describe even the highest aspirations of life.

For it scarcely needs observing, that cravings may have their origin not merely in the pleasures and pains

* Hobbes' *Leviathan*, p. 39, Molesworth's ed.

of sense. The impulsive power of a sensation depends on its power of giving pleasure and pain; but this power is not confined to feeling at the stage of mere sensation; it belongs equally to the stage of pure emotion. The impulsive action of feeling, however, even at this higher stage, does not constitute volition. Numberless actions in the daily life of all men are the thoughtless, involuntary promptings of emotion. A sudden ecstasy of joy, an unexpected excess of sorrow, a flash of hope or despair, an overwhelming panic, a furious outburst of anger,—such emotions will diffuse themselves irresistibly over various muscular regions, and determine all sorts of aimless actions. But a volition is not aimless or thoughtless; it implies a thought of the end to be attained by the action. How is this developed?

A volition, we have seen, is not merely an action unreflectively prompted, suggested by a previous association with some pleasure it produces. It implies a consciousness of this association, a conscious comparison of action and pleasure with a cognition of their relation as means and end. It is only when we thus reflect on the end to be attained by an action, that the action becomes voluntary. This fact is apt to be lost sight of, as it is obscured by an ambiguity in the use of the word *motive*. This term is sometimes employed to denote an impulse of sensibility, by which we are moved to act without reflection; and such action implies no intelligent control. But in a higher application the term is identified with intention or intelligent purpose; that is to say, a motive, in this sense, is an object set before consciousness as the end to be reached by the performance of an action. It is only actions directed by this higher sort of motives that are voluntary. A volition is an act of an intelligent being acting intelligently.

CHAPTER II.

THE MOTIVE POWER OF THE FEELINGS.

FROM the previous chapter it appears that, in order to volition, there must be a representation of the end to be attained. We have thus a test of the volitional quality of different feelings ; and it is found to be identical with that quality on which the intellectual and emotional life also depends,—that combination of associability and comparability which has been briefly described before as distinct representability. It is true that in the mental picture of ends it is often not so much the future feelings themselves that are represented, but rather the external circumstances in which these are expected. Nor is it difficult to understand why this should be the case. Not only are external circumstances, implying usually visual images, capable of being represented with greater vividness than pleasures and pains ; but it is by picturing in imagination the external stimulants of our pleasures and pains that these are realised in anticipation. Still, in order to endow our feelings with volitional power, they must be represented to the mind ; and therefore this power of our feelings demands some consideration here.

To understand this power in all its bearings, the feelings must be viewed both on their sensible side, that is,

as sources of pleasure and pain, and on their intellectual side, that is, as sources of knowledge.

I. In the former aspect they possess two somewhat contrasted properties, intensity and durability.

1. The intensity of a feeling, as we have already seen, is the degree in which it absorbs the consciousness. Now, the intensity of a feeling may be said to be the measure of its motive power while it lasts. This law implies two facts:—(a) that the power of a feeling to move us is naturally in proportion to its intensity, but (b) only while it lasts.

(a) The former statement is evidenced by the manner in which our moral judgment is modified by finding that an action has or has not been done under the influence of intense feeling. This modification is observed not only in the judgments of individuals and particular social circles; it has influenced even civilised jurisprudence. Though law properly concerns itself only with external acts, it has become common, in modern legislation, to mitigate the punishment of crimes perpetrated under powerful temptations, such as a theft of bread to escape starvation, or a homicide prompted by a sudden overpowering passion.

(b) But this statement is subject to the important qualification, that the intensity of a passion measures its motive power only while it lasts. After it has died away, it can be of influence as a motive only by being represented; and therefore its motive power depends then on its distinct representability. Indeed, as soon as reflection has had time to work, passion begins to wane; and in general, therefore, it may be said, that our feelings are powerful stimulants of action in proportion to their intensity only while they operate as unreflecting motives. As motives in the higher sense of the term, as objects of

intelligent purpose, they imply the power of being distinctly represented.

2. But before proceeding to this intellectual quality of the feelings, there is another quality, which they possess in their sensible aspect, demanding consideration. The durability of a feeling is its capacity of continuing in consciousness without relief. The relation of durability to intensity may be sufficiently expressed by saying that the two are in an inverse proportion to each other, if this mathematical formula is understood not to imply the exact measurements of quantity, which are characteristic of mathematical science.

This relation has impressed itself deeply on the common consciousness of men, and impressed itself as a fact of supreme importance in its bearing on the sum of human happiness. For, as already explained in connection with the theory of pleasure and pain, excessive or prolonged intensity, passing the limit of healthy action, destroys sensibility ; so that a period is soon put to the duration of intense feelings. "The breath of flowers," says Lord Bacon, "is far sweeter in the air, where it comes and goes like the warbling of music, than in the hand."* And the principle here implied holds good, not only of odours, but of all kinds of feeling. The pleasures which contribute most to our general welfare are those which come and go, or are of calmer tone and enjoyed in moderation. Fortunately, persistent intensity destroys sensibility to pain as well as pleasure. The worst agonies, therefore, as the brutal malice of the savage and the refined malice of the inquisitor equally know, are those pains which die away and return upon us afresh ; or they are those calm griefs which settle

* *Essay Of Gardens.*

down into a calm despair. "Dolor in longinquitate levis, in gravitate brevis solet esse; ut ejus magnitudinem celeritas, diuturnitatem allevatio consoletur."* It is for this reason that we refuse to trust in the continuance of intense feelings: we prefer a sober friendship to any "gushing" affection; and we look with certainty to the early decay of all ecstasies, sensual, intellectual, moral, and religious alike.

"His rash fierce blaze of riot cannot last,
For violent fires soon burn out themselves;"†

and there is a wise psychology in the old proverb, "Love me little and love me long." Even in the loftiest sentiment an excess of fervour, equally with any excess in mere sensation, is apt to abolish consciousness.

"In such high hour
Of visitation from the living God
Thought was not; in enjoyment it expired."

But the lesson, impressed on the mind by the relation of durability to intensity of feeling, is affected by an important qualification. We have already seen that variety is an essential condition of consciousness in general, of pleasurable consciousness in particular. Nothing neutralises all kinds of enjoyment more completely than monotony. An uniform calm, therefore, even of enjoyment, tends to degenerate into insipidity. To avoid this result it is usual to vary the even tenor of the emotional life by occasional seasons of heightened enjoyment. Though plain food forms the staple gratification

* Cicero, *De Finibus*, i. 12.

† *Richard the Second*, Act ii., Scene 1. Compare the passage from *Romeo and Juliet*, quoted above, p. 326.

of life, there is a need for feasts at times ; and this forms the reason of banquets, holidays, hightides. For one moment of intense enjoyment may, in many instances, be infinitely preferable to a feeble prolongation of the same feeling.

"Come what sorrow can,
It cannot countervail the exchange of joy
That one short minute gives me in her sight."*

It would appear also as if in the anguish of a second might be summed up the misery of years. In the history of some kinds of suffering man is not without occasional experience of a moment of unspeakable horror, regarding which it may be truly said, that

"In that instant o'er his soul
Winters of memory seemed to roll,
And gather in that drop of time
A life of pain, an age of crime."†

This fact, however, bears upon the feelings considered not merely as sources of pleasure and pain, but also as impulses to action. There is a tide in the emotions of men, which, taken at the flood, leads on to high achievements. Enthusiasm, that is, an unusual intensity of elevating sentiment, is necessary to raise men above a humdrum existence. And therefore, for the sake of energetic activity, men dare to risk the emotional storms

* *Romeo and Juliet*, Act ii., Scene 6. The idea is felicitously expressed in a German students' drinking-song :—

"Nippet nicht, wenn Bacchus' Quelle fließet,
Angstlich an des vollen Bechers Rand ;
Wer das Leben tropfenweis' genießet,
Hat des Lebens Deutung nie erkannt."

† Byron's *Glaucous*.

that are apt to arise out of inspiring enthusiasms, rather than be content with the dull ease of a placid career.

"Sound, sound the clarion, fill the fife,
To all the sensual world proclaim,
One crowded hour of glorious life
Is worth an age without a name."*

For the same reason man finds more interest in a brief period of the great historical nations with all their stir and strife than can ever be felt in the uneventful records of those peoples that have left no impress on the development of humanity.

"Better fifty years of Europe than a cycle of Cathay!"

Accordingly, to render possible a more exalted course of action, men adopt various means for cultivating to higher intensity the sentiments by which such a course is inspired. This is the happy effect that we seek in the companionship of sympathetic minds; and the great religious teachers of all ages are never weary of proclaiming that acts of religion have no significance or value except in cherishing the state of feeling which gives a nobler tone to life. Of course, there is a danger that the passionate susceptibility, which leads to splendid deeds, may be misdirected to meaner ends. Still, without its enthusiasms, life would scarce be worth living. To the general life of man they impart the charm of romance, and in the moral life particularly they are indispensable to heroic virtue. We can therefore understand why, in the more earnest movements of religious history, moderation has often been stigmatised, not indeed as implying positive vice, but as tending to cool the ardour of senti-

* Scott, *Old Mortality*, Chapter xxxviii.

ment necessary to reach the ideal at which these movements aim.

II. But it is not on their sensible side that the feelings are of chief interest in the development of the mental life. We have already seen that cognition and emotion owe their complicated developments to the intellectual qualities,—the associability and comparability,—of our sensations; and it is in virtue of these qualities, which have been summarily described as forming distinct representability, that the feelings contribute to the development of volition. Considered merely as sensible phenomena, the feelings may form unreflective impulses to action; but it is only by being distinctly representable that they can form intelligent ends. This aspect of the feelings, therefore, alters altogether the estimate of their motive power which we should form from their sensible qualities. It values a feeling not only while it lasts, but when it is afterwards revived in memory or imagination to form an object of intelligent reflection. It appears that the distinct representability of feelings may be generally described as in direct proportion to their durability, and therefore in inverse proportion to their intensity. From this it follows on the one hand that the calmer feelings are not only more durable, but more distinctly revivable in idea. Both of these facts are of great practical import.

1. We may well at times be struck with awe at the fact that feelings, which for the moment overpower by their intensity all other impulses, cannot be afterwards represented with any vividness. The reason of this fact has been already pointed out in the general principle, that a feeling, even if naturally pleasurable, passes, by its excess, the limit of health, and becomes destructive. The fact finds its illustration in all departments of our emotional life. There are many sensations, like those of sickness,

which absolutely control our conduct while we are under their power, yet leave but the faintest traces in imagination and memory. Perhaps, however, the most startling instance of the fact under consideration is to be found in the rapid access of repentance after excess, after the inordinate indulgence of any passion. Owing to the inverse ratio between the intensity and the durability of our feelings, the power of the criminal impulse collapses with appalling suddenness ; and in consequence of the inverse ratio of intensity to representability, being unable to quicken the dead passion into the after-life of memory, the guilty wretch stands aghast at his conduct, and cannot now realise what ever induced him to act as he has done. The famous scene, with which the second act of *Macbeth* opens, will long retain its terrible charm over the mind from the truthfulness with which it pictures this dread revulsion of feeling. It may be observed that a more pleasing illustration of the same revulsion is found in an emotional state resembling the nature of shame, that sometimes follows upon actions done under the influence of a high enthusiasm.

2. But the counterpart of this fact is also familiar in human life. The sources, from which we draw the materials for happy reflection and for pleasing constructions of the fancy in after years, are not, as a rule, the violent excitements of our sensibility, but those feelings which are of a calm nature, and which also endure commonly for a long time. This fact, however, is of interest, not only as pointing to the perennial sources of human happiness ; it points equally to the kind of feelings which must form the objects of intelligent volition. The man, whose conduct is dictated by the most intense passion of the moment, leads a life that is destitute of any determinate character. To attain con-

sistency of character the life must be guided by an ideal plan; and an ideal plan of life supposes, not merely the impulses that proceed from the variable moods of the sensibility, but motives that can be retained permanently in idea. Such motives, ~~however, can~~ be found only in connection with feelings that are distinctly representable.

CHAPTER III.

THE EXTENSION OF VOLUNTARY CONTROL OVER MUSCLES, FEELINGS, AND THOUGHTS.

THE most obvious and therefore the most intelligible sphere of volition is muscular activity. The nature of the volitional control of muscle has been partially explained in the opening Chapter of this Part. It was there shown that muscular activity is first stimulated by spontaneous or reflex or sensational impulses. The muscular activity, originated in any of these ways, excites pleasure or pain; and the pleasant or painful feeling excited becomes accordingly associated in consciousness with the activity which is its cause. When the feeling is afterwards represented, it recalls the cause; and we are accordingly moved to reproduce the cause in order to the reproduction of the effect.

But to guard against mistake, and prepare the way for further developments of volition, it is necessary to consider the nature of the feelings connected with the activity of the muscles. Muscular sensation is merely a peculiar mode of feeling which, though distinguished in quality from other feelings, is not a consciousness of the muscles, by whose action it is excited. Apart from anatomical study, muscular sensation can no more reveal the structure, or even the existence, of muscles

than a sound can tell the form of the cochlea, or a colour can reveal the rods and cones of the retina. The volition, therefore, which issues in muscular contraction, is not directed consciously towards the muscles contracted. I will, for example, to write certain characters on the paper before me with the pen which I hold in my hand. I am unable, without consulting an anatomical work, to tell precisely what muscles must be called into play in guiding the pen. But I have written the same characters a countless number of times before. After scores of somewhat unsuccessful efforts in school-days I have hit upon the precise muscular contraction required. That precise contraction is the source of an equally definite muscular sensation; and it is through this sensation alone that the required contraction becomes associated with the facts of my conscious life, and comes within the sphere of conscious volition. Accordingly when a familiar act is represented as an object of volition, I am able, through the muscular sensibility, to hit upon the muscular contraction necessary to the accomplishment of the act. If the act is still unfamiliar,—if it is one the performance of which still requires to be made into a habit or dexterity,—it is through the muscular sensibility that the acquisition is directed. From general use of the muscles I must of course be acquainted roughly with the limits within which the required muscular exertion lies. I can, therefore, hit more or less nearly on the precise contractions. It is here that the vast differences appear between individuals in regard to the sensibility and pliability of muscle. Some show a quick expertness, that seems to want no tuition, in finding the exact stroke of muscle demanded. For such nature has formed a basis for proceeding at once to those higher refinements, by which they may excel all ordinary

teachers, and attain the achievements of genius. Others, again, less favoured by nature, never succeed, even after laborious repetitions, in overcoming the clumsy awkwardness of learners.

It is important, then, to bear in mind, that, even in voluntary control of the muscles, volition is directed immediately, not to the muscles themselves, but to the sensations excited by muscular action. In passing, therefore, to voluntary control of the feelings, there is not such a wide gap in the evolution of will as might at first be supposed. In controlling the muscles themselves the consciousness is directed to a certain mode of feeling,—a mode of feeling, indeed, connected with the muscular mechanism by which we modify the external world, but a mode of feeling all the same. Consequently the transition, in this expansion of voluntary power is, in strictness, not so much from control of muscle to control of feeling as from controlling one mode of feeling to the control of another.

In fact there is, in many, if not in most, of the voluntary acts which control the feelings, a close affinity with those which control muscular movement. We have seen in the Introduction to the previous Part of this Book, that the feelings are in many instances associated with specific muscular movements as their expression. This association, it was further observed, is so close, as to constitute a certain dependence of the feelings on their expression; so that, by producing an expressive movement, the associated feeling may be in some measure reinstated. The dependence, indicated in this fact, is, however, manifested in other ways. The expression of an emotion is connected with the emotion by some natural law or laws, in whatever manner the connection may have originated; and consequently the

tendency of an emotion, when unresisted, is to find vent in its natural expression. But this tendency may be resisted, at least in those cases in which expression is connected with the voluntary muscles. We cannot indeed arrest the relaxation of the intestinal muscles often brought on by violent fear; we cannot check the quickened beat of the heart which emotional excitement generally produces, or restore the interrupted rhythm of the circulation which, under the influence of various feelings, makes the colour come and go on the face. But the laugh and the frown, the start of surprise, and the numerous gestures which form the familiar expressions of feeling,—these are all under conscious control. Now, the repression of these movements necessarily interferes with the natural play, and deadens the vivacity, of emotion.

In fact the play of emotion,—its indulgence,—consists in the influence which it exercises over the conduct of life; and this influence is exhibited, not only in the general human expressions of emotion, but also in particular acts in which emotion may be indulged at any moment. The real control of emotion consists in the repression of all its overt manifestations. The emotional life feeds upon its overt indulgencies, and without them cannot be sustained. Such indulgencies are often private, like the secret fondling of objects associated with any affection, or retired acts of devotion. There is nothing more frequently enjoined in treatises on practical religion than the necessity of such private acts for the cultivation of religious feeling. This injunction of religious teachers is based on an universal principle with regard to the culture of the emotions,—the principle that any emotional excitement may be controlled by keeping in check its active manifestations, and that emotions may be

starved out of existence by being habitually refused the indulgence they crave in directing external conduct.

To what extent such emotional repression should be carried, is a problem of ethics; and the great divisions of ethical speculation might be described as separating on the problem. For while an extreme Epicureanism seeks the chief good of humanity in some form of emotional excitement, and while an extreme Stoicism, finding in such excitement the source of all evil, enjoins the cultivation of an emotional apathy; more moderate ethical theories hold up the ideal of a life, in which rational conduct is warmed and beautified by rational feeling. This is not the place to dwell on these theories further than to point out that, amid all their differences, they agree in recognising the psychological fact, that the emotions can be voluntarily allowed to determine, or prevented from determining, the character of any human life.

It is this check upon their external manifestations that is commonly understood by the control of the feelings in our daily life. But it remains a question, whether such an account exhausts all that can be said of this control. It may be true that feeling is, not only in general, but always, bound up with some muscular manifestation; yet it is a very simple task of abstraction to separate in thought the feeling from its expression. It is quite conceivable, therefore, that though the feelings are usually repressed by restraining their outward manifestations, yet it is possible to direct conscious volition to the feelings themselves without reference to their manifestations. Whether this is actually the case or not, is a question which brings us to the ultimate problem of the will. In the discussion of this problem it will be found that some psychologists refuse to recognise any sphere of voluntary

control beyond the muscular system; and to such the utmost that can be meant by volition is the conscious anticipation of a muscular movement that is about to be felt by us. Whether this is a complete account of the limits of the will, must be discussed in the sequel. Meanwhile, as preparatory to that discussion, it is important to notice another extension of voluntary control.

As there is a certain control exercised over the feelings, so we can also, in a certain sense, control the thoughts. The explanation of this act has been prepared in discussing the Secondary Laws of Suggestion * and the nature of attention.† It was then shown that, while the phenomena before consciousness at any moment are multifarious, the consciousness is unequally distributed over them. While the majority of these phenomena attract comparatively little notice, on some, perhaps only on one, the consciousness may be concentrated either by an involuntary impulse of feeling or by voluntary effort. This concentration of consciousness controls our thoughts, not only for the moment, but also for the moments immediately following. For it makes the thoughts, on which the consciousness is concentrated, more powerfully suggestive than the rest, and consequently determines the line in which the current of thought will flow. It is this straining, this attention of the mind, that renders possible voluntary recollection, study, consecutive thinking. Let us look at the nature of the act more closely.

In some instances, at least, the act obviously resembles that of controlling the feelings by restraint of their outward manifestations. When the object of thought is a body actually present to sense, then attention to it in-

* Book i., Part ii., Chapter i., § 2.

† Book ii., Part i., Chapter ii., § 1.

volves some muscular act,—the fixing of the eyes, the breathless listening, the manipulation of a surface, the sniff of effluvia, or some similar action. Even when the object is one of abstract thought, the concentration of consciousness upon it implies, as already explained,* such a tension of our limited powers as to arrest activity in other directions. Unless a voluntary restraint is exercised over the restless muscular movement by which bodily life is in health usually characterised, the consciousness would be so distracted by the innumerable changing phenomena brought within its ken that attention would be impossible. The enforced quiet of the muscular organism produces a state of monotony in regard to outward impressions, and deadens thereby their power of stimulation. But this quiet is, of course, enforced by the voluntary control of the muscles; and it cannot, therefore, be doubted that attention, at least in its more definite forms, frequently,—it may be usually or even always,—implies muscular restraint. But here, as in regard to the voluntary control of the feelings, the question arises, whether in recognising this muscular restraint we have disclosed the whole nature of the volitions which direct the course of our thoughts. This question cannot be properly discussed except by entering upon the problem reserved for the concluding chapter.

CHAPTER IV.

FREEDOM OF VOLITION.

THE problem of this chapter is essentially identical with those ultimate problems regarding the general nature of knowledge, which were discussed in the sixth chapter of the first Part of this Book ; and, therefore, little remains to be done but to explain the bearing upon this problem of the principles involved in the previous discussion.

At the outset it may be worth while to recall the definition of voluntary action in the first chapter of this Part. It was there shown that many so-called actions are due to unreflecting impulses, and that the term *motive* is very often used for impulses of this kind. On the other hand, this term is also frequently applied to the conscious purpose, the end which we have in view when we act. It is only actions of the latter class that are voluntary. A volition is therefore an act of a person who knows what he is doing, and who, in knowing what he does, knows the end which his action is adapted to attain. Now, it is not maintained that human actions are generally of this voluntary sort. On the contrary, it may be admitted that the majority of actions,—all the actions which make up the routine of daily life,—are of the mechanical type, even though they may be the result of habits voluntarily formed, and may therefore

continue subject to voluntary restraint. Man is encircled by the systems of natural law, limited by them in his original constitution, rewarded or punished by them in his repeated actions. So far his activity is like any other natural product ; but the question remains, whether it does not essentially imply something more.

The question, then, in reference to the freedom of volition is confined to those acts which alone are entitled to be called volitions,—those in which the agent consciously seeks to reach a certain end. Accordingly, it leaves out of account, and we may throw aside as a meaningless fiction, that sort of freedom which has been called the “liberty of indifference,” that is, a power to act free from the influence of any motive whatever. Whether such a freedom can be claimed for man or not, it is not worth claiming ; for a motiveless act cannot be an intelligent act, since it implies no intelligence of the end which the act is designed to accomplish. On the freedom of the will, then, as thus defined, there are two theories, or sets of theories.

I. One holds that, whatever distinction may be drawn between the actions, to which the term volition is restricted, and those that are done unreflectingly, there is no difference in so far as the law of causality is concerned. According to this law, every phenomenon is absolutely determined by some antecedent phenomenon or phenomena ; and consequently every action of man receives its definite character from the immediately antecedent circumstances in which it was done, it being understood that antecedent circumstances comprehend the condition of the agent himself as well as the condition of his environment. The manifold agencies in the physical world excite their multitudinous tremors in the nervous system : these are followed by appropriate

states of consciousness,—feelings, cognitions, desires; and the phenomena, which we call volitions, are merely further links in this chain. Every volition, therefore, on this theory, is regarded simply as an event in time, wholly determined, like any other event, by events preceding.

This has been commonly called, in former times, the theory of Necessity, and its supporters Necessitarians. Recent advocates of the theory, however, generally object to the term Necessity, as implying compulsion without consent, whereas the theory regards the consent of the agent as one of the conditions of a voluntary action. On this account Determinism has been suggested, and is now generally adopted, as an appropriate designation of the theory.

Though a certain form of Determinism has often been maintained by theologians of the Augustinian and Calvinistic schools, yet the doctrine tends at the present day to ally itself with that general theory of man's origin, which regards him as, in mind and body alike, merely the last evolution of organic nature on our planet. According to this view man's consciousness is simply the product of the forces in his environment acting on his complicated sensibility, and of that sensibility reacting on the environment. His consciousness, therefore, stands related to other phenomena precisely as these are related to each other, each being acted upon by the rest, and reacting upon them, so that all are absolutely determined by this reciprocity of action. On this view man's self is not a real unity, forming by its unifying power, out of an unintelligible multiplicity of sensations, an intelligible cosmos; it is a mere name for a factitious aggregate of associated mental states. The only actual self is the sum of feelings of which we are conscious at any moment; and the actual

self, therefore, differs with the variation of our feelings. Such a self evidently offers no intelligible source of any activity that is not absolutely determined by natural causation.

II. The opposite theory, maintaining that volition is in its essential character free from the determinations of natural law, is spoken of as the doctrine of Liberty, or of the Freedom of the Will. Its supporters are sometimes called Libertarians. This doctrine contends, in one form or another, that there is an essential difference between human volitions and other events, and that their character is not to be interpreted, like that of other events, solely by referring to the antecedent circumstances in which they were done. This theory tends to ally itself at the present day with that Transcendental Idealism, which refuses to accept Empirical Evolutionism as a complete solution of the problem of man's nature.

The doctrine of Liberty insists on the essential distinction between the reality, the unity, of the self and that of objects. The notselves, that make up the objective world, have no real point of unity, no selfhood ; so that from themselves nothing can originate. But the self is a real self, a real centre of unity, from which radiate all the unifying functions of intelligence that form into intelligible order the world of sense. The self, therefore, stands related to the notselves of the objective world, not simply as these are related to each other ; it is contradistinguished from the whole of them in a way, in which each is not contradistinguished from the others, as the intelligent interpreter without which they could form no intelligible system. This system is formed of parts which are construed as holding relations of reciprocal causality ; but the intelligence, that construes the system, is not simply one of the parts, whose

action is absolutely determined by the action of the rest.

As we have seen in the previous discussion on self-consciousness, it is this distinction of self from the whole universe of notselves, that alone renders intelligible the cognition of that universe. It is also the independence of self on the universe of notselves, that alone renders intelligible its voluntary action on that universe. For a volition is not an act, *so* which I am impelled by the forces of external nature beating upon my sensitive nature; it is an act, *in* which I consciously set before myself an end, and determine myself towards its attainment. The very nature of volition, therefore, would be contradicted by a description of it in terms which brought it under the category of causality.

This freedom of the self from determination by the world of objects is the fact which alone explains, without explaining away, the consciousness, that there is within us a centre of conscious activity which is, in the last resort, impregnable by any assaults of mere force. You may apply to my organism superior forces of organic or inorganic bodies, and compel *it* to act as you wish. You may employ all the sensible inducements at your disposal in order to bend me to your purpose; you may tempt me with the most bewitching delights of sense, or scare me with its most frightful agonies. You may even, by ingenuity of torture, so shatter my nervous system as to prevent me from carrying out into the world of sense the deliberate resolutions of myself. But there is one thing which mere force,—force separated from reason,—cannot do; it cannot compel *me*.

CHAPTER V.

CONCLUSION.

THE preceding discussions, brief though they are in comparison with those of more elaborate treatises, may yet be felt to be incomplete without a summary of their general results. Psychology being the science of man's mental life, its problems present not only the interest of scientific questions in general, but the higher interest of those questions which bear specially upon man's nature, his origin and his destiny. These questions, in their essential significance, cannot be approached except through the path of man's mental life: it is this that at once creates their perplexity, and opens the way to their solution. Moreover, the mental life of man, involving the problems of his essential nature and origin and destiny, involves also the problems of the nature and origin and destiny of all things. For, if these problems can be solved at all, the solution can be reached only by the nature of things being revealed to the human mind, and that can be revealed only under the conditions to which psychology shows that the human mind is subject; while, even if the essential nature of things be unknowable, it can be shown to be so only by an analysis of the conditions of knowledge, such as is furnished by the psychologist.

The mental life of man, as we have seen at the outset, is distinguished from other phenomena by the consciousness with which it is accompanied. It is not necessary to discuss whether the so-called mental life of the lower animals is likewise characterized by this accompaniment, whether any of these can ever consciously think within itself, "*I feel pleased or pained, I know this object as distinct from that, I will direct my action so as to attain this or that end.*" Such consciousness forms the essential feature of man's mental life, and forms also *the* fact which requires explanation in any theory of man's nature and origin and destiny. For it is obvious that any such theory is called to explain mainly, how man came to conscious activity, and what is the function which such an activity implies in the universe. Now, as we have seen more than once, the fact of consciousness presents, on the face of it, features which prevent us from treating it simply as one among the manifold phenomena of nature, as if it held the same relation to these which they hold to one another. This distinction is more or less explicitly acknowledged by all. Even if conscious phenomena are subjected to the same methods of scientific treatment as the phenomena of nature in general, they are yet recognized as forming a group by themselves, differentiated by their distinctive characteristic from all phenomena which are not accompanied by consciousness.

The relation, therefore, in which the phenomena of consciousness stand to other phenomena — or, briefly, the connection of mind and matter, of soul and body — has long been regarded as invested with a peculiar mystery, a difficulty of being scientifically comprehended, other and greater than any difficulty which science encounters in comprehending the mutual relations of material phenomena. Accordingly, the history of philosophy reveals

various theories on the relation of mind and matter; and these theories are in fact, merely particular phases of the views held on the fundamental problems of human knowledge.

One theory may be said to cut, rather than to untie, the knot of the problem. It maintains that there is in reality no connection whatever between the phenomena of mental life and those of the material world. The two classes of phenomena are conceived as running in parallel currents, in which certain phenomena of one class are found to be uniformly contemporaneous with certain phenomena of the other; but this uniform co-existence of phenomena in the two classes implies nothing more than concurrence in time. Thus the mind is never really influenced by the movements of the material world, nor are these movements ever really modified by the efforts of the mind. Sometimes, indeed, a physical movement, such as a nervous vibration, is followed by a feeling, while a conscious volition is followed by a bodily movement. But in such cases the one phenomenon is merely a concomitant of the other: neither can be said to exert upon the other any real influence.

This theory, though propounded in earlier times, found its fullest development in the speculations of Descartes and of his school, especially of Geulinx. It has also been associated with various theological doctrines, which it is unnecessary here to discuss. At the present day the theory finds a more or less explicit support from some psychologists, who look upon all the overt acts of life in general, and of human life in particular, as being scientifically comprehensible without ascribing to consciousness any real influence in determining their course. The purport of this theory may, perhaps, be best understood by taking any familiar act, and trying to imagine

how it would require to be conceived. Suppose, then, a human being, in whose organism a morbid process begins. If the process is not in the nerve-tissues themselves, it will attack them by and by, and send a thrill to the brain. Reacting from this excitement, the brain sends a stimulus along the motor-nerves, sets the limbs of the patient in action, and causes him to move towards the residence of his medical adviser. There the vocal organs of the patient are excited to activity, and produce vibrations of the air, which strike upon the ear of the doctor, who is led in his turn to move the organs of his voice, and probably also to move his fingers for the purpose of writing out a prescription. The prescription is then taken to an apothecary, and made up, and ultimately administered to the patient. Now, according to the theory of Descartes, all this would go on precisely as it actually happens, even if there were no feeling or thought either in the patient or in his medical adviser; that is to say, the bodily actions are entirely independent of the conscious mental actions, and entirely unaffected by them. It is surely obvious, however, that the efficient factor in such a series of actions is the conscious suffering of the patient: apart from his painful thoughts and feelings there would be no *motive* to action at all.

But this theory may be tested in another way. How is the origin of pleasure and pain to be explained from the standpoint of modern evolutionism? It must be supposed that conscious feelings of pleasure and pain, when first experienced, gave to the animal that experienced them a certain advantage over others. If they had been of no advantage, they would soon have vanished from the universe as mere *lusus naturæ* that fulfil no function. But the fact is, that pleasure and pain have remained through innumerable generations among the

most prominent phenomena of life, and their continuance implies that they fulfil some function, that they are of some advantage to living beings. But they can give this advantage only if they have some causal efficiency, and therefore the conscious feelings of sentient beings must have some influence upon their life.

Another theory might likewise be described as simply a rude cleaving of the knot, inasmuch as it maintains that there is no fundamental difference between consciousness and other phenomena, so that it must be explained by the same scientific concepts which interpret the others. On this theory conscious activities are simply phenomena of nature, produced by processes of natural causation like the phenomena of the material world. This is the psychological and philosophical system known as materialism; that is to say, it maintains that all reality is, in the last analysis, reducible to matter and motion of matter. This system is commonly interpreted at the present day by an hypothesis about the constitution of matter which conceives it as being composed of exceedingly minute and ultimately indivisible particles — atoms. According to this hypothesis, every real event in the universe must be interpreted as a movement of atoms, either separately or in those larger or smaller masses into which they are combined; and the task of science is completed when it succeeds in making such an interpretation.

Now, this is not the place to inquire whether the phenomena of the material world itself can be interpreted intelligibly on such an hypothesis. To the philosophical physicist or chemist or biologist it will appear a very obvious question, whether the facts, which he observes, are intelligibly or completely explained as implying merely that some atoms or molecules or masses of matter have changed or are changing their relative positions in

space.* Such questions, though indirectly, are not necessarily forced on the psychologist. For him the problem is, whether, even if the facts of material nature imply nothing but matter and its motion, the facts of man's conscious life admit of being explained in the same terms.

On this point fortunately little more is required than that the student should clearly present to his thought the meaning of the question raised. Almost every attribute, that can be predicted of a thing as existing and moving in space, is unthinkable in application to the thoughts and feelings of a self-conscious being. Even granted that the impact of external agencies upon our organism, and the activities which they set up in the nervous system, thrilling into the most secret chambers of the brain, may all be explained as movements; yet, whenever you pass from the last thrill in the molecules of the brain to the activities of conscious life, you enter upon a region where the familiar landmarks of space and matter, of atoms and motion, are no longer to be discerned, and therefore intelligence must seek direction from a totally different order of concepts. Accordingly, in the common thoughts of men, as interpreted in their ordinary language, and in the more exact thought of science and philosophy, there has always been recognized a distinction between the internal life of consciousness and the external world, which renders it impossible to represent the former as reducible to the same order of facts with the latter. "The passage from the physics of the brain to the corresponding facts of consciousness is," says Professor Tyndall,† "unthinkable. Granted that a definite thought and

* In the literature of this question a prominent place must be given to the able work of Mr. J. B. Stallo, "*The Concepts and Theories of Modern Physics*," in the International Scientific Series.

† Address on the Scope and Limit of Scientific Materialism in "*Fragments of Science*," p. 131.

a definite molecular action of the brain occur simultaneously; we do not possess the intellectual organ, nor apparently any rudiment of the organ, which would enable us to pass, by a process of reasoning from the one to the other. They appear together, but we do not know why. Were our minds and senses so expanded, strengthened and illuminated as to enable us to see and feel the very molecules of the brain; were we capable of following all their motions, all their groupings, all their electrical discharges, if such there be; and were we intimately acquainted with the corresponding thoughts and feelings, we should be as far as ever from the solution of the problem, 'How are these physical processes connected with the facts of consciousness?' The chasm between the two classes of phenomena would still remain intellectually impassable." In these words Dr. Tyndall has simply expressed the conviction of every competent thinker who has considered the subject.

It is thus acknowledged that it is impossible to find any intelligible interpretation of mind in terms of matter. On the other hand, is there any impossibility in the opposite procedure which takes mind with its concepts as the starting-point, and interprets the material world by these? Such an interpretation would simply mean the discovery of a *reason* in every material thing, such a comprehension of material realities as would imply that they are all harmonious parts of one rational system. Now, it must be obvious, on a moment's reflection, that such a comprehension or interpretation of the material world is nothing but the avowed object of all science. As already stated,* scientific effort would be at once paralyzed by the suspicion, that there is any factor of knowledge which, in the last analysis, may be a surd

* Above, p. 229.

quantity, incapable of being brought into intelligible relation with the general system of thought.

The obvious inference from all this is, that the universe, as intelligibly interpreted, is the construction of an Universal Intelligence. To evade this conclusion, however, a conception is sometimes adopted, which, while implied in a good deal of earlier speculation, has become perfectly explicit in a prominent school of thought at the present day. According to this conception, the universe, so far as known to us, indeed, is an intelligible system; but, as such, it is merely a construction of human intelligence; what it is, apart from the construction we put upon it, never can be known. Man, therefore, is doomed forever to hopeless ignorance regarding the real nature of the universe in which he lives: what he takes for facts with an independent reality are merely fictions of his own mind:

"Rerumque ignarus imagine gaudet."

Now, in order to determine whether our knowledge reveals to us realities, or merely appearances about which we can never know what they represent, two questions require to be considered: We must, first of all, decide what is meant by knowing *anything*; and, in the second place, we must define the object about which we wish to find out whether it can be known or not.

With regard to the first point, it is obvious that, when anything is known, it must stand in such a relation to the person knowing it as to admit of its being known by him. Knowledge, in fact, may be said to *be* a relation between a knower and a thing known. It is evident, therefore, that, if a thing is to be known at all, it can only be by forming one term of the relation that constitutes knowledge. To try to know an object that cannot be brought into relation with any intelligent being

would be the nonsensical game of trying to find a relative without any relations, — a parent that never had a child, an antecedent that has no consequent, or, to use one of Ferrier's homely vivid images, a stick with only one end. It may be added, that, when a thing is known, it must be brought into relation with other known things; that is to say, as explained fully in the previous pages, a thing becomes an object of knowledge only by being identified with, and differentiated from, other objects. These facts may be summed up in the statement, that a thing cannot be known if it is out of relation to all other things; and it is these facts which constitute the real meaning of the often misunderstood doctrine of the Relativity of Knowledge. Even, therefore, if there could be anything which is out of relation to everything else, for us and for all intelligent beings it would be nothing, since it could never by any possibility be known.

Having determined what is meant by knowing, we must now, in the second place, define what the object is, about which it is disputed whether it can be known or not. 'Tis evident that, if you wish to approach without prejudice the question, whether a certain object is knowable, you must not at the outset define it in terms which preclude the possibility of its being known. But this is what we find perpetually done in connection with the subject we are at present discussing. If a thing is to be really known, we are told it must be known as it is in itself; and that is explained to mean, as it is when taken away from relation to everything else. Now, even if there could be any reality in the universe, existing out of relation to every other, it must be a reality about which the human mind can well afford to be indifferent. For no intelligence, indeed, could such a reality possess the slightest interest. To be of interest to us, an object

must be capable of influencing us for good or evil; and it cannot be of any influence without coming into some relation with us. A reality, therefore, which is defined to be out of relation to every other, has no bearing on the present question. For such a reality is already defined in terms which render it unknowable; and accordingly the definition implies merely that, if there is anything which is out of relation with everything else, it cannot be brought into relation with a knower, and cannot therefore be known.

But the definition is really meaningless. So far as we can attach any meaning to the language, a thing is what it is in itself by virtue of its relations to other things; its essential nature, its real force, consists in its reciprocity of action with everything else; and, apart from such reciprocal relations, it is nothing at all. These relations, of course, being practically infinite, can never be exhaustively known. All our knowledge is therefore partial; but it is valid as far as it goes. It is a knowledge of reality, because it is a knowledge of those relations—those identities and differences—which constitute the real nature of all things.

INDEX.

- Abercrombie, Dr., 187, 254, 255.
 263, 266, 270, 279, 280
 Addison, 129
 Affection, 370
 Afferent nerves, 20
 Age, 10
 Alimentary sensations, 35, 40, 68
 Allen, G., 59, 132, 133, 230, 252,
 316
 Anæsthesia, 252
 Anaxagoras, 43
 Anthropology, 12
 Antipathy, 375
 Anytus, 386
 Apparitions, 248
 Apprehension, Simple, 211
A priori and *a posteriori*, 284
 Aristotle, 34, 315, 322
 Architecture, 237
 Art, 234
 Articulate sounds, 155
 Artman and Hall, 151
 Astrology, 8
 Attic salt, 128
 Augustinianism, 428

 Bacon, Lord, 35, 81, 412
 Bailey's *Festus*, 330
 Bain, Professor, 143, 288, 300, 338,
 372, 383, 395, 406
Barbaros, 158
 Beaumont and Fletcher, 144
 Beauty, 234
 Bell, Sir Charles, 335
 Berkeley, 146, 166
 Biography, 6
 Blacklock, 187
 Blushing, 367
 Boerhaave, 34

 Brace, Julia, 135
 Bradley, 395
 Braid, 349
 Brewster, 177
 Bridgman, L., 49, 50, 141, 145, 206
 7
 Brillat-Savarin, 129, 131
 Brown, Dr. T., 391
 Burke, Edmund, 343, 346
 Burns, 132
 Butler, Bishop, 378
 Byron, Commodore, 384
 Byron, Lord, 330, 390, 414

 Calvinism, 428
 Carlyle, 365
 Carpenter, Dr., 35, 145, 280
 Cerebro-spinal system, 19
 Chalmers, Dr., 277
 Cheselden's patient, 165, 168, 169,
 187, 352, 353, 354, 355
 Cicero, 81, 382, 413
 Clang-tint, 54
 Coleridge, 265
 Colloids, 34
 Colours, 57
 Common sense, 121, 286
 Composition, 240
 Concept, 211
 Conceptualism, 202
 Consciousness, 2
 Consonants, 155
 Contractility, 66
 Contrast, 86, 393
 Cowper, 329
 Crusades, 82
 Crystalloids, 34
 Cumberland, S. C., 144
 Curiosity, 397

- Cyrenaics, 315
 Dallas, 265, 273, 315, 323
 Dante, 86
 Darwin, 335, 367
 Davy, Sir H., 143
 Dead strain, 66
 Deduction, 223
 Demeter, worship of, 357
 Democritus, 45
 Descartes, 185
 Determinism, 428
 Dickens, 253
 Diderot, 185
 Dionysus, worship of, 357
 Direct remembrance, 77-78
 Disposition, 11
 Donaldson, H. H., 46, 70
 Drummond, Agnes, 270
 Ecclesiastes, 351
Eery, 401
 Efferent nerves, 20
 Electricity, 73
 Electrobiology, 271
 Emotion, 312
 Empirical, 285
 Emulation, 396
 Envy, 385
 Epicureanism, 423
 Epidermis, 41
 Erdmann, 116
 Euripides, 351
 Experience, 285
 Facial sense, 141
 Fallacies, 248
 Familiarity, 99
 Fatigue, 72, 325
 Fear, 390
 Fechner, 28
 Ferguson, Adam, 81, 317, 386.
 Fine arts, 234
 Flaubert, 253
 Flavour, 35
 Fontenelle, 322
 Franz's patient, 43, 166, 168, 169
 Galen, 34
 Geiger, 59
 Genius, 11
 Giants, 134
 Gladstone, 59
 Goethe, 330
 Goldsmith, 327
 Gough, 43, 150
 Grace at meals, 128
 Gray, 333
 Gregory, Dr., 262
 Grey, Earl, 252
 Gurney, 281
 Habit, 10, 103-7
 Hall, G. S., 46, 64, 280
 Haller, 34, 133
 Hallucinations, 248
 Hamilton, Sir W., 34, 64, 78, 100,
 116, 121, 122, 146, 192, 194,
 197, 223, 227, 231, 233, 286,
 308, 324
 Harmony, 160-1
 Hauser, Caspar, 135
 Hecker, 352
 Hegel, 261, 336
 Helmholtz, 51, 60 61, 156, 168,
 174, 181, 250
 Herbart, 78
 History, 7
 Hobbes, 219, 377, 408
 Holmes, O. W., 138, 266, 273
 Hope, 390
 Howe, Dr., 136, 206
 Humboldt, 134
 Hume, 305, 322
 Huxley, 12, 253
 Hyperæsthesia, 251
 Idea, 227
 Ideal, 226-7
 Imagination, 230-1
 Indignation, 384
 Indirect remembrance, 77
 Induction, 224
Innate, 286
 Instinct, 104, 184
 Intoxication, 73
Intuition, 284
 Invariable association, 103
 Itch, 47
 Jealousy, 386
 Job, 365

- Johnson, 82
 Kant, 116, 227, 308
 Keats, 132
 Kitto, 49, 150, 152, 162, 186
 Lamson's Life of L. Bridgman, 49,
 50, 145, 157, 206
Langeweile, 329
 Language, Science of, 6, 158
 Leckie, 278
 Lefthandedness, 44
 Leibnitio-Wolfian School, 116
 Leibnitz, 185
 Lenau, 330
 Leonardo da Vinci, 173
 Levy, 43, 141, 145
 Leyden, 279
 Libations, 128
 Linnaeus, 34
 Literature, 238
 Locke, 185, 203, 215, 304, 305
 Logic, 112, 210
 Longet, 131
 Lotze, 78, 116, 149
 Lubbock, 201, 384
Lunaticus, 8
 Magnetism, Animal, 271
 Mahaffy, 169
 Mansel, 308
 Mark's Gospel, 164
 Marlowe, 330
 Massieu, 186
 Maudsley, 134, 136, 141, 186, 253,
 254, 255
 M'Cosh, 303
 Meier, 116
 Melody, 159
 Memory, 99-100, 297-9
 Mendelssohn, Moses, 116
 Mesmer, 74, 271, 274
 Mill, J. S., 97, 212, 213, 215, 217,
 221, 222, 288, 291, 292, 293,
 294, 299, 300, 315, 317, 319
 Milton, 132, 137, 358
Mind, 1
 Mitchell, James, 50, 135, 138
 Mnemonics, 80
 Modesty, 367
 Monotony, 392
Moonstruck, 8
 Motive, 409
 Movement, breadth, form, and velo-
 city of, 22
 Movement, sensations of, 66
 Moyes, 151, 185
 Müller, Maler, 330
 Müller, Max, 197
 Music, 158-163, 238, 348-350
 Natural history of man, 6
Naturel, 11
 Nausea, 36
 Negative pleasures and pains, 333
 Neuralgia, 72
 Newton, 185
 Nightmare, 263
 Nominalism, 202-3
 Nomology, 210
 Nunneley, 168
 Object, 1-2
 Odylism, 271
 Overtones, 55
 Painting, 237-8
 Palate, 33
 Paræsthesia, 252
 Passion, 312
 Pastimes, 329
 Pearson, 143
 Perez, 168
 Personal equation, 29
 Physiology, 11
 Pitch, 53, 159
 Plato, 34, 115, 257, 315
 Plot-interest, 401, 403
 Positive pleasures and pains, 333
Prescind, 191
 Preyer, 167, 351, 352
 Psychology, origin of the name, 1;
 distinguished from Logic, 210
 Psychophysics, 24-8
 Puiseaux Du, 186
 Pulmonary sensations, 39, 67
 Pungent sensations, 36, 41, 47
 Pure cognitions, 285
 Quality of tones, 54, 159
 Quinctilian, 81
 Race, 9

- Ramists, 1
 Realism, 202
Reason, 286
 Recollection, 91
 Refinement, 117
 Reichenbach, Von, 74, 271
 Reid, 174, 267, 379
 Relativity, 88
 Relish, 36
 Remorse, 367
 Renan, 158
 Representation, 76
 Resemblance, 84, 393
 Resentment, 382
 Ridicule, 395
 Righthandedness, 44
 Romanes, 5
 Rousseau, 138

Savour, 35
 Schelling, 236
 Schiller, 230
 Scott, 323, 415
 Scottish School, 121, 286
 Sculpture, 236
 Self-evidence, 218
Sensation, sense, sensibility, sensible, sensitive, defined, 18
 Sentiment, 312
 Sex, 10, 378-380
 Shakespeare, 33, 80, 84, 137, 174, 180, 260, 268, 320, 322, 324, 325, 326, 330, 364, 413, 414
 Shame, 367
 Simonides, 81
 Socrates, 314, 315, 386
 Somnambulism, 269-281
 Spalding, 184
 Spectres, 248
 Spectrum, or after-image, 250
 Spectrum, or rainbow, 57
 Spencer, 12, 43, 201, 219, 230, 288, 300, 308, 315, 317
 Spinoza, 254, 360
 Spirit of the age, 9
 St. Vitus' dance, 352
 Stewart, D., 50, 100, 135, 137, 141, 149, 185, 267, 270, 403
 Stoicism, 314, 423
 Striking likeness, 93
 Study, 90-91

 Subject, 1-2
 Suggestibility, 93-100
 Suggestion, 76
 Suggestiveness, 90-93
 Sully, 253, 295
 Sympathetic system, 19
 Sympathy, 372-5

 Taine, 253
 Tarantati, 352
 Tedium, 329
 Teiresias, 149
 Temperament, 11
 Temperature, sensations of, 48, 70
 Tennyson, 40, 86, 96, 132, 180, 330, 348, 361, 366, 368, 415
 Tetens, 116
 Theophrastus, 34
 Thomson, Dr. W., 215
 Thomson, James, 377
 Thought-reading, 144
 Tickling, 47
Timbre, 54
 Todd and Bowman, 145
 Tragedy, 321-5
Transcendental, 284
 Trench, 382
 Truth, 228
 Tylor, 12, 201, 207, 384

 Unconscious cerebration, 107
Understanding, 286
 Uniform association, 101

 Vanity, 369
 Virgil, 86, 276, 387
 Vowels, 156

 Wardrope's patient, 168, 352
 Warner, 335
 Weber, 28, 42, 146
 Weird, 401
Welsch, 158
 Wheatstone, 173
 Wholes, different kinds of, 232-3
 Wilson, Dr. D., 44
 Wilson, Dr. G., 344
 Wordsworth, 235, 236, 331, 363, 413
 Wundt, 12, 60, 64, 78, 116, 162, 168, 183, 253, 280, 316, 319, 335

Index.

445

Xenophon, 386

Young, 60

| *Zeitgeist*, 9
| Zeno, 307

70
330,

363,

162,
319,